County of San Luis Obispo

# EnergyWise Plan

*Designing Energy and Climate Solutions for the Future*

November 2011









County of San Luis Obispo
Department of Planning and Building

# COUNTY OF SAN LUIS OBISPO

# ENERGYWISE PLAN

*Designing Energy and Climate Solutions for the Future*

November 2011

Adopted by the San Luis Obispo County Board of Supervisors

November 22, 2011 - Resolution 2011- 381

County of San Luis Obispo

Department of Planning and Building

# ACKNOWLEDGMENTS

**Climate Change in San Luis Obispo County**

When people talk about what can be done about reducing the effects of climate change, many wonder how anything meaningful can be done about something that is global in scope. While it will take worldwide efforts to solve issues relating to climate change, incremental steps to improve the situation must still be taken here at home. For example, if most of us take individual actions to reduce energy use in our homes and the number of car trips we take to get around, we can make significant reductions in greenhouse gas (GHG) emissions while saving money at the same time.

Granted, problems that involve the entire planet may be formidable; however, such challenges have been met before with success. An example is the successful international effort to phase-out use of chlorofluorocarbons (CFCs) in aerosol sprays and refrigerants, which were destroying the Earth's protective ozone layer. This and other success stories give reason to believe that climate change can also be dealt with effectively if meaningful action is taken soon.

The County of San Luis Obispo acknowledges that climate change could result in significant effects on the Central Coast if significant steps are not taken to reduce GHG emissions. These effects were described in a report prepared by the GEOS Institute and the Local Government Commission (LGC) in November 2010. Based on climate change model projections from three global climate models, as well as peer-reviewed scientific publications, local experts and leaders identified many changes that could occur in San Luis Obispo County by the end of this century. Following are some examples of those changes:

- Hotter, drier, and longer summers
- More severe storms
- Accelerated sea level rise
- Increase in wildfire
- Loss of many oak and pine forests
- Accelerated erosion of coastal bluffs
- Declining wetlands, marshes, and estuaries
- Declines in water quality and flow in streams and rivers
- Increase in erosion and sediment
- Lower groundwater recharge rates
- Less productive range for cattle
- Increase in natural disasters (floods, droughts, fires)

# ACKNOWLEDGMENTS

These consequences not only would affect our region's natural environment, but also would have a significant impact on private properties, public infrastructure, and our local economy, including the tourism industry.

The central premise of this plan is to identify ways to achieve a GHG emissions reduction target of 15% below baseline levels by the year 2020. In so doing, we will realize many other benefits, such as lower utility bills, reduced fuel costs from driving less, and reduced costs of maintaining municipal facilities, to name a few.

**Energy Efficiency Conservation Block Grant**

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# ACKNOWLEDGMENTS


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# EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY

The County of San Luis Obispo (County) recognizes that global climate change will have significant impacts locally and throughout California unless significant steps are taken to reduce greenhouse gas (GHG) emissions. This EnergyWise Plan (Plan) demonstrates the County's continued commitment to addressing the challenges of climate change by reducing local GHG emissions and preparing the county to adapt to a changing climate. This Plan outlines the County's approach to reducing GHG emissions through a number of goals, measures, and actions that provide a road map to achieving the County's GHG reduction target of 15% below baseline levels by 2020.

## EnergyWise Plan Purpose & Scope

This EnergyWise Plan is required by the Conservation and Open Space Element (COSE) of the General Plan and is intended to facilitate the goals of the COSE, though implementation of the reduction measures contained in this plan will require action by the Board of Supervisors. This Plan builds upon the goals and strategies of the COSE to reduce local GHG emissions. It identifies how the County will achieve the GHG emissions reduction target of 15% below baseline levels by the year 2020 in addition to other energy efficiency, water conservation, and air quality goals identified in the COSE. This Plan will also assist the County's participation in the regional effort to implement land use and transportation measures to reduce regional greenhouse gas emissions from the transportation sector by 2035.

## 2006 Greenhouse Gas Inventory and Forecast

In May 2010, San Luis Obispo County adopted a greenhouse gas inventory (Inventory) as part of the Conservation and Open Space Element of the General Plan. The Inventory calculates municipal and community-wide emissions caused by activities in 2006, including transportation, waste, agriculture, energy, and aircraft-related activities. The Inventory establishes a baseline against which future changes in emissions can be measured and provides

The California Air Resources Board estimates that California's GHG emissions grew 15% percent between 1990 and 2005 and will grow an additional 15% by 2020. The State has recommended to local governments that for data and accuracy purposes, reducing GHG emissions 15% below baseline levels by 2020 would be the equivalent of reaching 1990 GHG emissions levels.

**Top 5 GHG Reduction Strategies:**

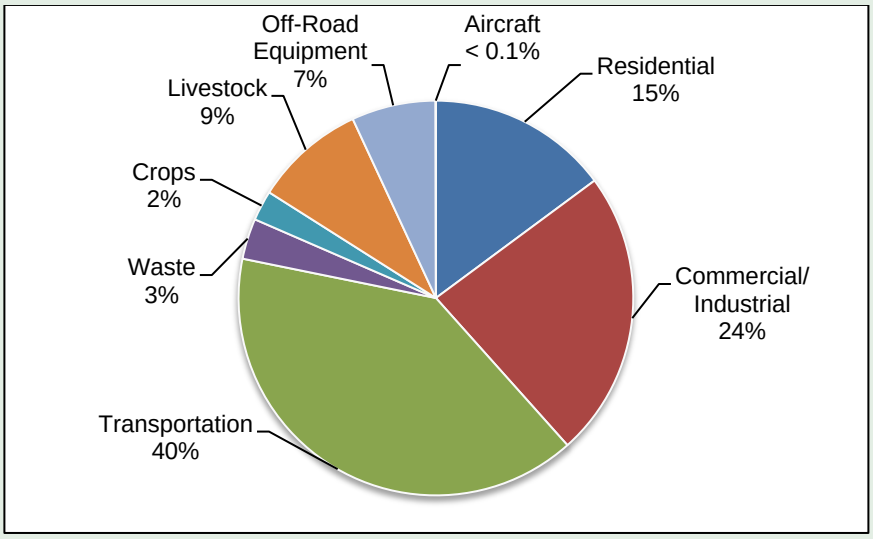
1. Countywide Energy Collaborative
2. Landfill Methane Capture
3. Energy Efficiency Financing
4. Parking Supply Limits
5. Building Energy Scores

an understanding of major sources of GHG emissions in the unincorporated county.

As part of the EnergyWise Plan development process, the 2010 Inventory was reviewed and updated. These updates incorporate new data, protocols, and best practices to ensure that this Plan is methodologically up to date.

The Inventory update found that the unincorporated San Luis Obispo community emitted 917,700 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2006. $MTCO_2e$ is a universal way to equalize the different potencies of the six greenhouse gas emissions in one comparable unit. Updated community-wide total emissions by sector are shown in **Figure ES-1.** On-road vehicles were the greatest contributor to the county's baseline emissions (40%). Commercial/industrial energy use and residential energy use were the next largest contributors, with 24% and 15% of overall emissions, respectively.

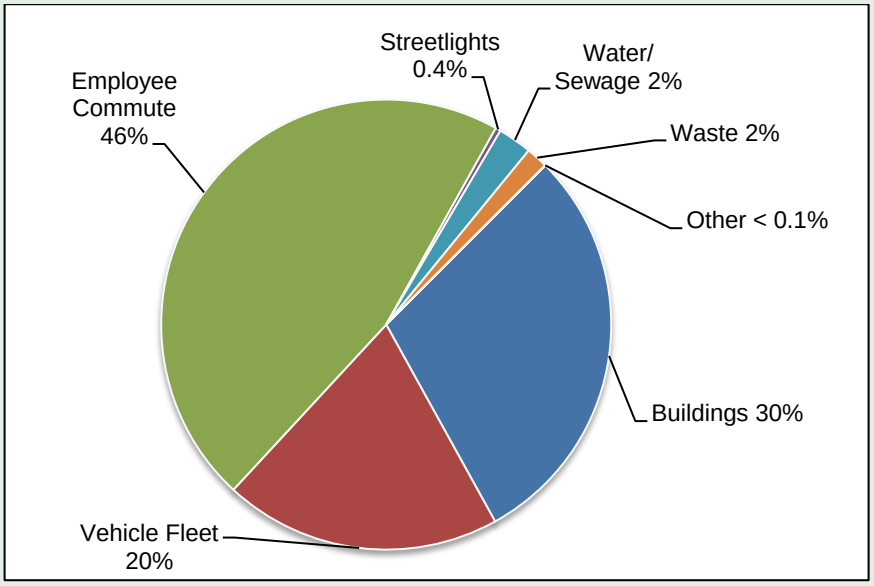
**Figure ES-1.** Community-Wide 2006 GHG Emissions



The Inventory also includes a separate assessment of GHG emissions from County activities. The County operations inventory with updated emissions sources provides the basis for developing the emissions reduction measures presented in this Plan. The inventory findings are presented in **Figure ES-2.**

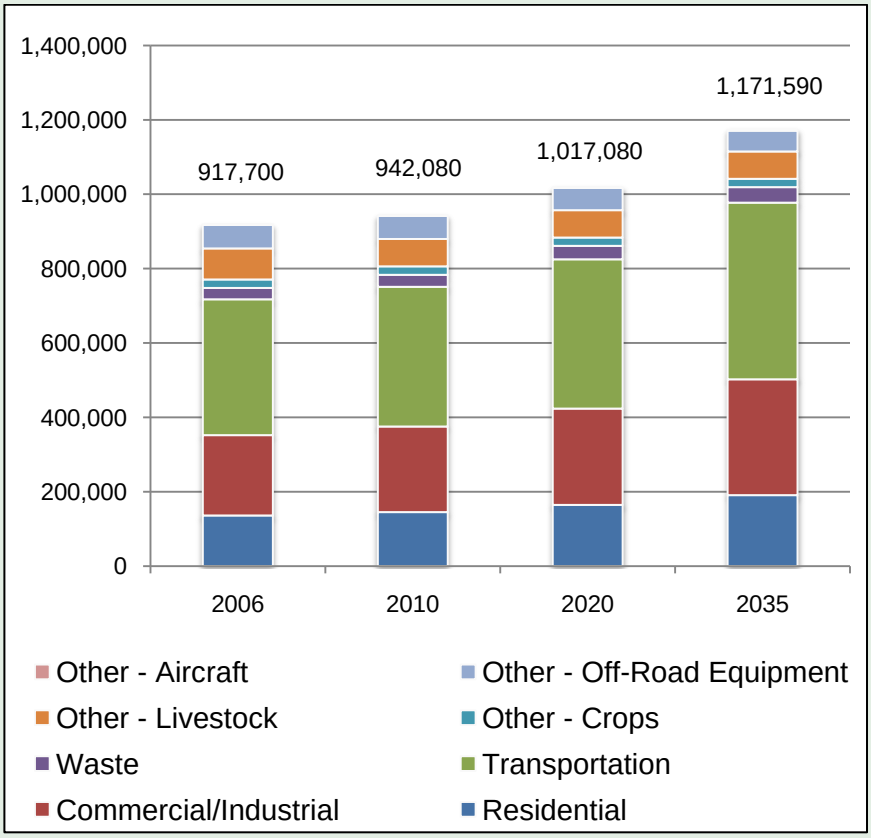
The primary contributors of GHG emissions are employee commute (46%), buildings (30%), and vehicle fleet (20%). Water/sewage (2%), waste (2%), streetlights (0.4%), and other (0.01%) make up the remaining GHG emissions from County operations. In 2006, GHG Emissions from County operations totaled 16,870 $MTCO_2e$.

## **Figure ES-2.** County Operations 2006 GHG Emissions



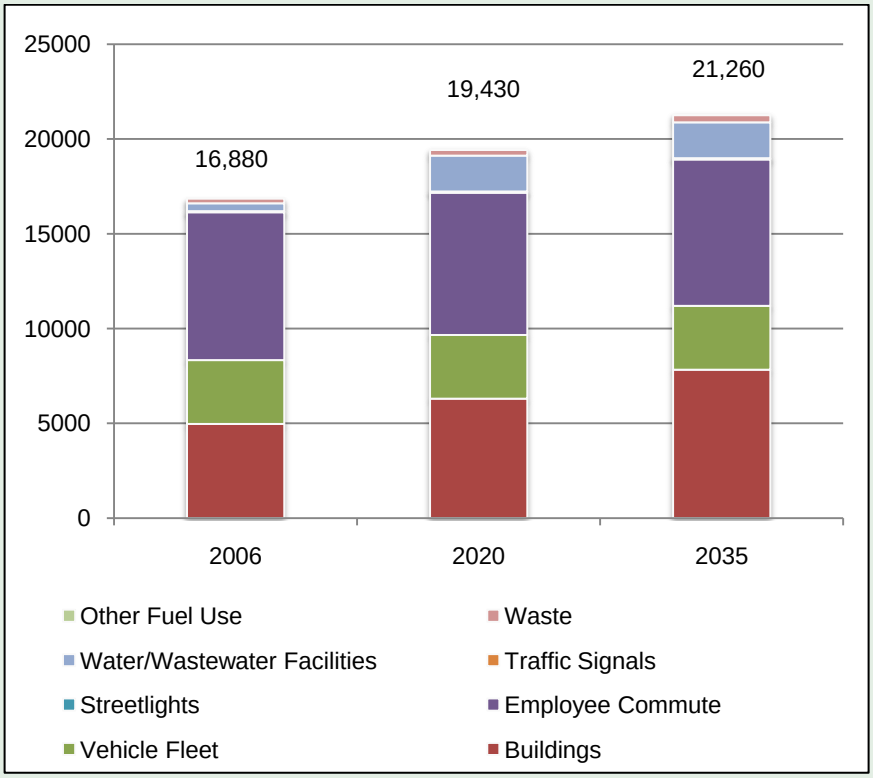

Using data from the updated 2006 baseline Inventory, the County created an estimate of how emissions will grow by 2020 and 2035 with the unincorporated county's expected population, household, and nonresidential growth. This estimate, also known as an emissions forecast or projection, demonstrates how community-wide emissions will continue to grow if regulatory or technical interventions are not put in place to reduce GHG emissions. The community-wide forecast is depicted in **Figure ES-3**.

**Figure ES-3.** Community-Wide GHG Emissions Forecast ($MTCO_2e$)




County government operations are more difficult to forecast by sector due to a lack of reasonable growth indicators. Without known growth indicators for each sector, the business-as-usual (BAU) projection reflects baseline year emissions through 2020 and 2035. The forecast, shown in **Figure ES-4**, reflects changes in energy and transportation sectors to show anticipated changes to energy use related to water and wastewater treatment and distribution and changes to the County's employment.

**Figure ES-4.** County Operations GHG Emissions Forecast




The County General Services Agency has retrofitted 25 County buildings through the Energy Watch Partnership resulting in savings of:

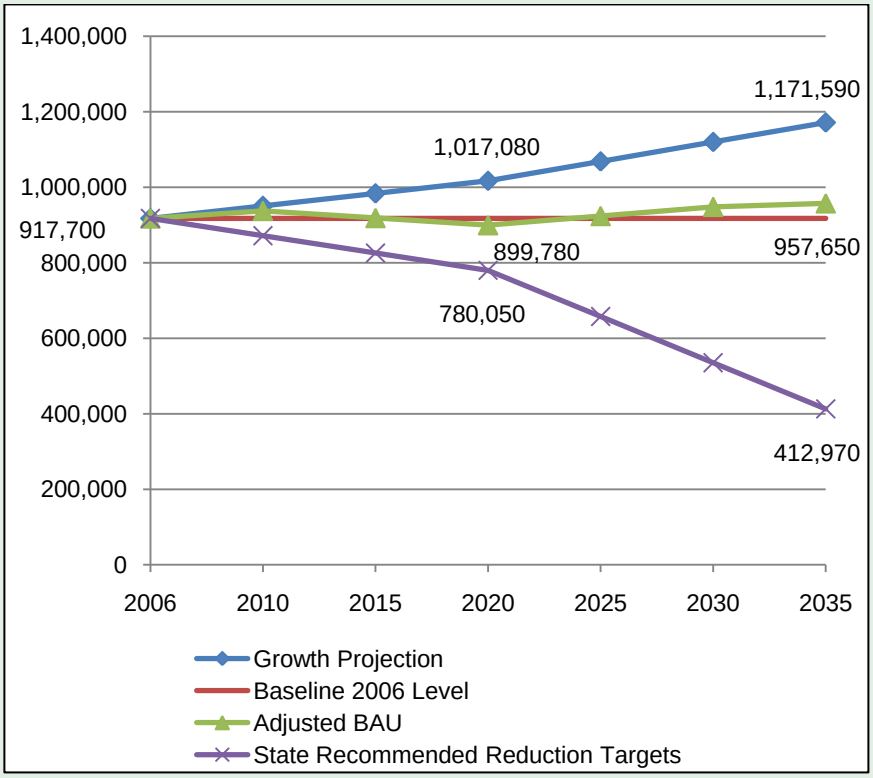
- 69,000 kWh per year
- $30,400 per year

### Adjusted BAU Forecast

An adjusted business as usual (ABAU) utilizes the BAU forecast and incorporates State policies and programs that will affect local GHG emissions. The ABAU forecast accounts for state and federal actions such as mandated fuel efficiency standards, renewable electricity standards, California's green building code, CALGreen, and federal vehicle efficiency standards. Accounting for these actions provides a more accurate picture of future emissions growth and the responsibility and ability of local governments versus the state to reduce greenhouse gas emissions. The Adjusted BAU, shown in **Figure ES-5,** reduces emissions below 2006 baseline levels by 2020**.** The figure also shows the state-recommended reduction target of 15% below 2006 levels by 2020 and reductions continuing through 2035, consistent with Governor's Executive Order (EO) S-03-05 to reduce emissions by an additional 80% by 2050. The objective of this Plan is to bridge the gap between the

county's growth forecast and the state's recommended reduction targets.

**Figure ES-5.** Comparison of Forecast to Baseline and Reduction Target ($MTCO_2e$)




## GHG Reduction Strategies

### *Community-Wide GHG Reduction Strategies*

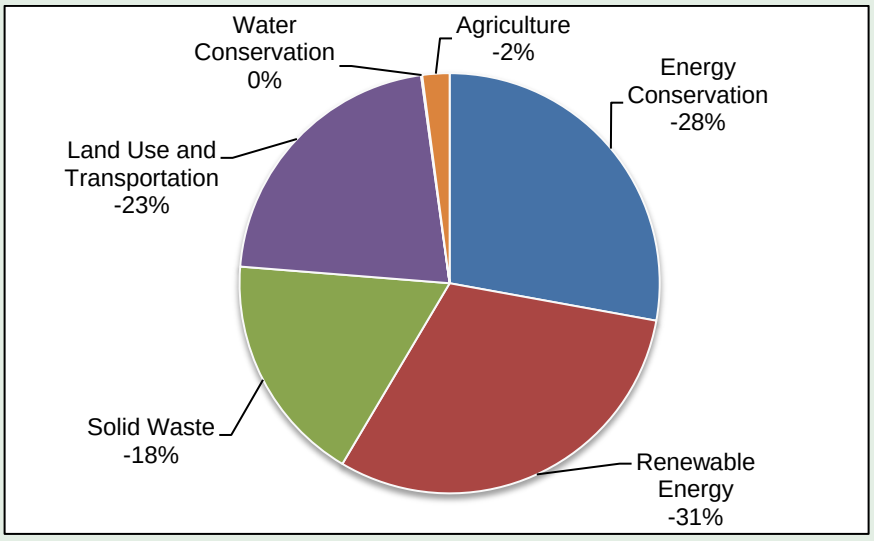
To achieve the community-wide GHG emissions reduction target of 15% below 2006 baseline levels by 2020, the County will need to implement a variety of GHG reduction measures. Reduction measure program topics include energy conservation, renewable energy, solid waste, land use and transportation, water conservation, and agriculture. The GHG emissions reductions from these strategies are summarized in **Table ES-1**.

**Table ES-1.** Community-Wide GHG Emissions Reduction Summary by Goal

| Goal | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|
| Energy Conservation | -1,100 | -37,500 | -73,670 |
| Renewable Energy | -450 | -41,290 | -57,920 |
| Solid Waste | 0 | -23,880 | -31,750 |
| Land Use and Transportation | 0 | -29,020 | -40,170 |
| Water Conservation | -10 | -120 | -250 |
| Agriculture | 0 | -2,810 | -5,270 |
| **Total** | -1,560 | -134,620[1] | -209,030[1] |

1. Due to rounding of decimals, the sum of all values may not equal the total.

**Figure ES-6.** 2020 Community-Wide GHG Emissions Reduction Summary by Goal



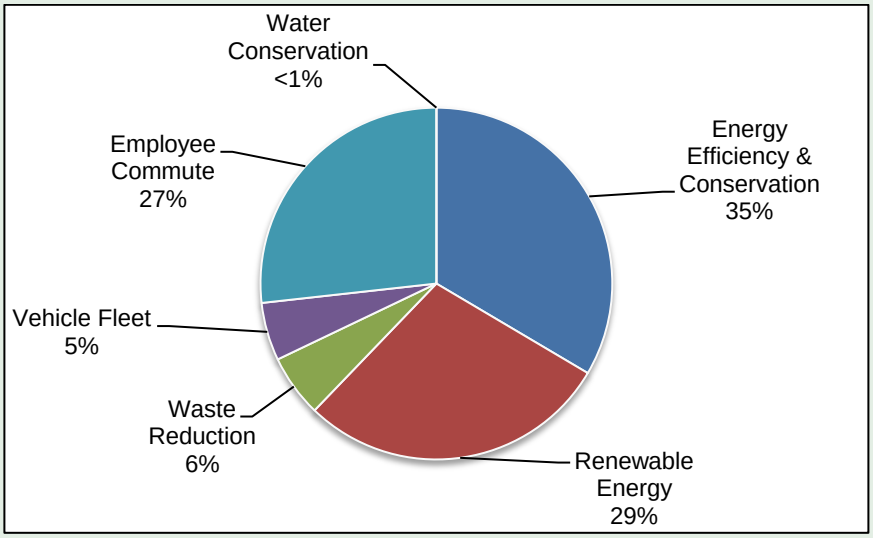

In addition to implementing strategies for reducing GHG emissions from community-wide activities, the County will implement strategies to reduce GHG emissions from County operations 15% below 2006 baseline levels by 2020. Reduction measure program topics include energy efficiency & conservation, renewable energy, waste reduction, vehicle fleet, employee commute, and water

conservation. The GHG emissions reductions from these strategies are summarized in **Table ES-2.**

**Table ES-2.** County Government Operations GHG Emissions Reduction Summary by Goal

| | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|
| Energy Efficiency & Conservation | -90 | -820 | -1,360 |
| Renewable Energy | -120 | -700 | -820 |
| Waste Reduction | -10 | -140 | -270 |
| Vehicle Fleet | -5 | -120 | -240 |
| Employee Commute | -290 | -660 | -990 |
| Water Conservation | n/a | n/a | n/a |
| **Total Reductions** | **-515** | **-2,440** | **-3,680** |

**Figure ES-7.** County Government Operations 2020 GHG Emissions Reduction Summary by Goal



### Adaptation

The County anticipates that some degree of climate change will occur regardless of existing and future GHG reduction and mitigation efforts. As a result, the County will need to understand the potential impacts of climate change and take steps to adapt to or manage potential changes to the local environment or socioeconomic system in an effort to reduce risks and increase resilience. Chapter 7 identifies the potential impacts that climate change may have in San Luis Obispo County and identifies options to address those impacts to protect the County's residents, economy, and ecosystems.

### Implementation

The Implementation Program (Program) provides a strategy for action with specific measures and steps to achieve the identified reduction targets. The Program identifies responsible departments, potential costs to the County and community, cost savings, time frames for action, and the indicators that will be used to measure progress. The Program for community-wide measures notes the applicability of each measure to new or existing development and identifies the co-benefits that will occur in addition to reducing GHG emissions. The Program provides detailed matrices to identify the costs, savings, responsible department, and necessary actions required for the successful implementation of each measure.



**Differences between adaptation strategies and mitigation measures**

The IPCC Fourth Assessment Report defines mitigation and adaptation as follows:

Mitigation (Reduction Measures) – Implementing policies to reduce greenhouse gas emissions and enhance sinks.

Adaptation – Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.



# 1 – INTRODUCTION

# PURPOSE AND SCOPE

The County of San Luis Obispo (County) acknowledges that global climate change will have significant adverse impacts locally and throughout California unless significant steps are taken to reduce greenhouse gas (GHG) emissions. This EnergyWise Plan (Plan) demonstrates the County's continued commitment to addressing the challenges of climate change by reducing local GHG emissions, with an emphasis on improving the energy efficiency of buildings and transportation, and preparing the county to adapt to a changing climate.

This EnergyWise Plan is also referred to as a climate action plan or greenhouse gas reduction plan. The name of this Plan highlights the County's focus on energy as a key sector to addressing local greenhouse gas emissions.

This Plan identifies how the County will achieve the GHG emissions reduction target of 15% below baseline levels by the year 2020 in addition to other energy efficiency, water conservation, and air quality goals identified in the Conservation and Open Space Element (COSE) of the County's General Plan. In addition to reducing GHG emissions, these goals will provide additional benefits to the community such as lower energy bills, improved air quality, expanded economic growth, and enhanced quality of life.

Specifically, this Plan:

- Provides the scientific and regulatory framework for addressing climate change and greenhouse gases (GHGs) at the local level (refer to Chapter 2).
- Identifies sources of GHG emissions within the unincorporated county and estimates how these emissions may change over time (refer to Chapter 3).
- Forecasts emissions to reflect the County's desired population projections without regulatory or technical intervention to reduce GHG emissions (refer to Chapter 4).



The name of the Plan – EnergyWise - *Designing Energy and Climate Solutions for the Future* highlights the County's focus on energy as a key sector to addressing local greenhouse gas emissions.

**Benefits of the EnergyWise Plan:**

- Lower utility bills
- Improved air quality
- Expanded economic growth
- Enhanced quality of life

# INTRODUCTION



**Assembly Bill 32 - AB 32**

The California Global Warming Solutions Act of 2006 represents California's effort to reduce GHG emissions and combat global climate change.

For more information on regional transportation issues visit SLOCOG's website:

www.slocog.org

- Provides an emissions reduction target consistent with Assembly Bill (AB) 32 and the County's General Plan (refer to Chapter 4).
- Provides energy use, transportation, land use, water use, and solid waste strategies to reduce community-wide GHG emissions.
- Quantifies the potential emissions reductions that will be achieved by implementing and identifies relative costs and savings of each strategy (refer to Chapter 5).
- Identifies existing and proposed strategies to reduce GHG emissions from County operations and facilities, quantifies the potential emissions reductions and identifies relative costs and savings of each strategy (refer to Chapter 6).
- Provides methods for reducing County's GHG emissions consistent with the State's goals and Public Resources Code Section 21083.3. [The California Environmental Quality Act (CEQA) Guidelines encourage the adoption of policies or programs as a means of comprehensively addressing the cumulative impacts of projects.
- Proposes an adaptation approach to increase the county's resiliency to climate change (Chapter 7).
- Presents an implementation program (Program) to assist with monitoring and prioritization of the reduction strategies through 2020 (refer to Chapter 8).

This Plan will also assist the County's participation in the regional effort led by the San Luis Obispo Council of Governments to implement land use and transportation measures to reduce regional GHG emissions from the transportation sector by 2035 (per Senate Bill 375).



# LOCAL SETTING

San Luis Obispo County covers an area of approximately 3,300 square miles (2.1 million acres) from the coast to the central valley of California. The county includes seven incorporated cities: Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo, and 15 unincorporated communities: Avila Beach, California Valley, Cambria, Cayucos, Cholame, Creston, Lake Nacimiento, Los Osos, Nipomo, Oceano, San Miguel, San Simeon, Santa Margarita, Shandon, and Templeton.

The county is divided into three geographic or climate regions: coastal plateau, Upper Salinas River Valley, and east county plain. The coastal plateau is immediately inland from the Pacific Ocean and is typically 5 to 10 miles wide. It ranges in elevation from sea level to about 500 feet above sea level and is bounded by the Santa Lucia Range to the northeast.

The Santa Lucia Range rises to roughly 3,000 feet elevation and runs parallel to the coast almost the entire length of the county. The Upper Salinas River Valley lies inland from the Santa Lucia Range in the northern portion of the county. The east county plain lies further inland along the eastern flank of the county and includes about one-third of the county.

## Demographics

Nearly 40% of the entire county's population lives within unincorporated communities or on rural lands in the county. In 2010, the unincorporated county had an estimated 108,000 residents.[1] Forecasts estimate that the unincorporated county's population will grow by an additional 30,000 people between 2010 and 2035.

[1] San Luis Obispo Council of Governments. 2010. Long-Range Socio-Economic Projections



The unincorporated county's population primarily resides in smaller urban communities or rural areas. These communities are typically able to meet the daily services and needs of the community but residents may need to travel to nearby communities or cities for other services. Historic land use and travel patterns in the unincorporated county are typically reliant on private vehicle use, as limited transit and alternative transportation can make it difficult to travel between communities efficiently.

## Plan Area

This Plan is applicable to all unincorporated areas of San Luis Obispo County, including the community service districts (CSD) within the county. **Figure 1-1** identifies the geographical boundaries used to determine which sources of GHG emissions were included within the County's inventory and which sources are attributed to the incorporated cities within the county.

In cases where the County lacks direct regulatory authority to require GHG emissions reductions, staff will collaborate with local CSDs and state or federal agencies to ensure that the emissions reduction measures in this Plan can be implemented by these agencies.

## Local Climate

Nearly 75% of the county's population and businesses are located within the coastal plateau, while roughly 25% of the population lives in the Upper Salinas River Valley and less than 1% of the population lives in the east county plains. The coastal plateau exhibits a more moderate Mediterranean climate with summer fog and mild temperatures due its proximity to the Pacific Ocean. Further inland, the climate becomes more continental, with colder winters and markedly warmer summers.

The California Energy Commission has classified California into distinct climate zones to recognize the variability in energy use based on local weather patterns. The Energy Commission uses these climate zones to determine energy budgets and prescriptive packages for new and renovated buildings for each climate zone to ensure that they meet the State's Title 24 energy efficiency standards.

San Luis Obispo County is split into two different climate zones. The areas of the county north and east of the Santa Lucia Range fall into climate zone 4, while the coastal areas are classified climate zone 5 (**Figure 1-2**).

## PREPARATION OF THE PLAN

In 2009, the County was awarded an Energy Efficiency and Conservation Block Grant (EECBG) from the United States Department of Energy (DOE). The County developed an Energy Efficiency and Conservation Strategy (EECS) to determine how the EECBG funds would be used to reduce energy use. As part of the EECS, the County dedicated a portion of its EECBG funds to prepare this Plan as a key implementation program of the County's Conservation and Open Space Element of the General Plan. Other programs currently funded through the grant include HVAC upgrades and lighting retrofits to multiple County facilities, replacement of streetlights with light-emitting diode (LED) lighting fixtures, installation of bicycle infrastructure, and the development of a Green Building Ordinance.

Adopted by the Board of Supervisors in May 2010, the County's COSE directs staff to prepare and implement a plan to reduce greenhouse gas emissions in the county. The EnergyWise Plan, also commonly referred to as a climate action plan or greenhouse gas reduction plan, will be adopted as a separate and "stand alone" planning document that is consistent with and directly applicable to the goals, policies, strategies, and actions of the General Plan.

The planning process for this Plan relied on a comprehensive public participation strategy to engage residents, business owners, and



In 2009, the County was awarded an Energy Efficiency and Conservation Block Grant (EECBG) from the United States Department of Energy (DOE) as part of the American Recovery and Reinvestment Act. The County dedicated a portion of its EECBG funds to prepare this Plan as a key implementation program of the County's Conservation and Open Space Element of the General Plan.





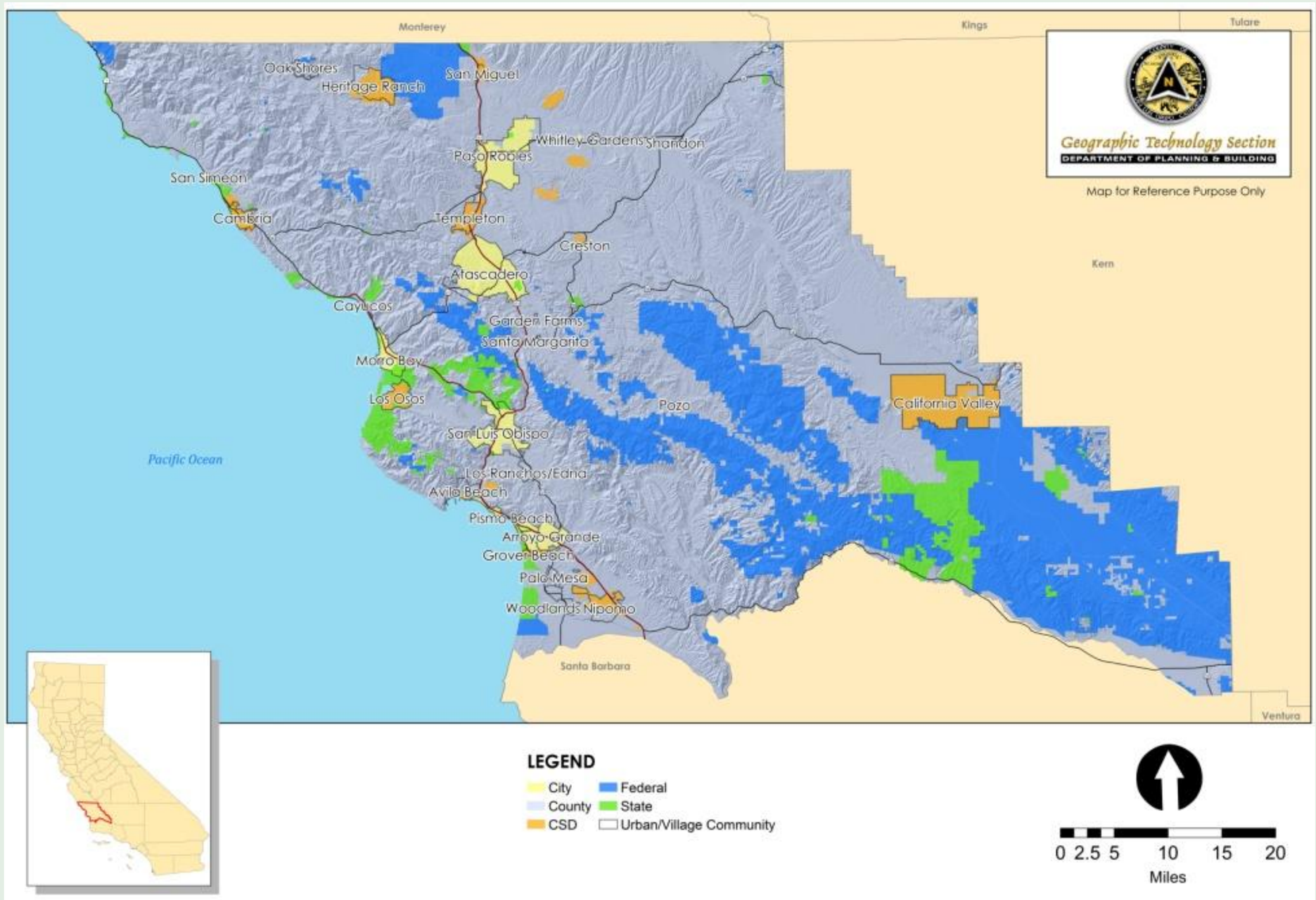



other stakeholders in the identification and refinement of goals, programs, activities, and projects to reduce emissions. The public participation process included two County-sponsored community workshops, County participation in community-sponsored workshops, stakeholder focus group meetings, an online survey, development of a project website, interagency coordination, and numerous speaking engagements, presentations, and conversations with the staff planning team.

The project website provides access to all workshop and meeting notices and materials, links to resources, an online survey, and a forum to submit comments and questions to staff. In addition, the County Department of Planning and Building's profile on Facebook and Twitter provided status updates on the Plan and alerts for workshops.

The County presented the Draft Plan for public review in April 2011. With the receipt of public comments, the County has revised the Plan presented it at public hearings to the Planning Commission and Board of Supervisors. This Plan is accompanied by an environmental review document consistent with the California Environmental Quality Act and was adopted via Resolution 2011-381by the San Luis Obispo County Board of Supervisors on November 22, 2011.

**Figure 1-1.** EnergyWise Plan Jurisdictional Figure





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**Figure 1-2.** EnergyWise Plan Climate Zone





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# USING THIS PLAN



This Plan serves as the County's greenhouse gas reduction strategy, commonly referred to as a climate action plan. The COSE framework and stakeholder input emphasized the focus of this Plan on energy with a preference to reduce energy use, improve energy efficiency and diversify local renewable sources of energy as a means to reduce greenhouse gas emissions.

This Plan provides a greenhouse gas (GHG) emissions inventory, GHG forecast, GHG reduction target, and a set of strategies to respond to local contributions to and effects of climate change. The primary objective of this Plan is to provide the County's strategy to address climate change locally.

The Conservation and Opens Space Element of the General Plan was updated in 2010.

### GHG Reduction Measures

The GHG reduction strategy is represented by GHG reduction measures and actions to reduce GHG emissions from community-wide sources (Chapter 5) as well as county operations (Chapter 6).

Reduction measures are organized by key issue or goal area. Each reduction measure is presented with a set of actions, a summary or description of the measure, an implementation table, reference to an applicable COSE goal, policy, or strategy, and a summary of reductions and co-benefits.

The implementation tables specific to each measure identify the County agency responsible for the implementation of the measure, the time frame for implementation, ranges of the costs and savings that will be associated with the measure, and the indicators that will be used to measure progress.

County departments responsible for implementing this Plan include:

Planning and Building,

General Services, and

Public Works

- **Implementation Timeframe:** The implementation time frame is an important consideration in quantifying the GHG reduction impact that each measure will have, as many measures will have a cumulative impact on GHG emissions and delayed implementation will reduce the effectiveness of each measure in helping to achieve the GHG reduction targets. The time frame indicated for each measure will



assist with budgetary and decision-making processes and ensure that measures are implemented in a logical order and timely manner.

- **Responsible Department(s):** Responsible departments are identified for each measure. In some cases, involvement from multiple departments may be required to effectively implement the measure.

- **County Costs:** County costs are an estimate of anticipated costs to the County for implementation of the measure by 2020. County costs may include staff time to develop programs and ordinances, any incentives that will be provided, or increased costs associated with purchasing and construction compared to current practices. These ranges are presented in current (2010) dollars.

- **Community Costs/Savings:** The effective implementation of each program may require community investment in addition to the County costs for each program. However, additional savings from reduced energy, fuel, or water use will offset these added costs.

- **County Savings:** Savings to the County are also evaluated for County operations measures. Due to the difference in scale between community and County savings potentials, the savings to be achieved by the County will use the scale presented in Chapter 8.

- **Relevant General Plan Policies:** Many of the community-wide and County operations reduction measures are based on adopted policies in the County's General Plan. The policies are primarily from the COSE, though some related to the built environment stem from other General Plan policies, goals, and objectives.

- **Progress Indicators:** An indicator is a quantitative measurement of the progress or success of each reduction measure. The progress indicators used in the

implementation plan to demonstrate how many homes or businesses will need to participate in a particular program or the amount of waste that will need to be diverted from the landfill to reach the GHG reduction of each measure. The progress indicators used in this Program rely on data that is already tracked by the County through annual reporting or would be readily available through partner agencies or data requests to utility providers.

All implementation details are compiled in a summary implementation table in Chapter 8.

### Quantifying GHG reductions and benefits

The quantified reductions and benefits resulting from implementation of this Plan distinguish this Plan from other County planning documents. When sufficient information is available, emissions reduction measures have been quantified to indicate the contribution that a measure will have to overall GHG reductions. This number is presented in $MTCO_2e$ reduced per year. In some cases, the GHG reduction benefit is not quantifiable on its own, but is included in another strategy. Other measures may not have a direct GHG reduction benefit, but are critical to the success of other reduction strategies.

In addition to reducing GHG emissions, many measures will provide numerous co-benefits to the community while furthering the sustainability goals of the County. These co-benefits are depicted in this document through the following graphic symbols.



**What is a Metric Ton?**

The international reporting standard for carbon dioxide ($CO_2$) emissions is in metric tons. There are 2,204 lbs per metric ton.

Reducing 1 million metric tons (MMT) $CO_2$ is equivalent to:

- Not driving 216,000 passenger cars for one year
- Saving 114 million gallons of gasoline
- Saving 2.3 million barrels of oil
- One year of electricity use by 128,000 average U.S. households or 193,000 average California households



**Figure 1-3.** Potential Co-Benefits of GHG Reduction Measures





# 2 – SCIENTIFIC AND REGULATORY FRAMEWORK

# CLIMATE CHANGE SCIENCE OVERVIEW



Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases faster than the earth's natural systems can absorb them. These gases are released as by-products of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities.

While often used interchangeably, there is a difference between the terms "climate change" and "global warming." According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period of time that can be caused by both natural factors and human activities.[1] Global warming, on the other hand, is an average increase in the temperature of the atmosphere caused by increased greenhouse gas emissions. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature.

**The six internationally recognized greenhouse gases include:**

Carbon dioxide ($CO_2$)

Methane ($CH_4$)

Nitrous Oxide ($N_2O$)

Sulfur Hexafluoride ($SF_6$)

Chlorofluorocarbon (CFC)

Hydro-Chlorofluorocarbon (HCFC).

## The Greenhouse Effect

Our planet is reliant on the greenhouse effect, which results when the atmosphere captures the heat that radiates away from the earth toward space. Several gases in the atmosphere function as barriers and trap heat within the planet's atmosphere, including water vapor, carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons.

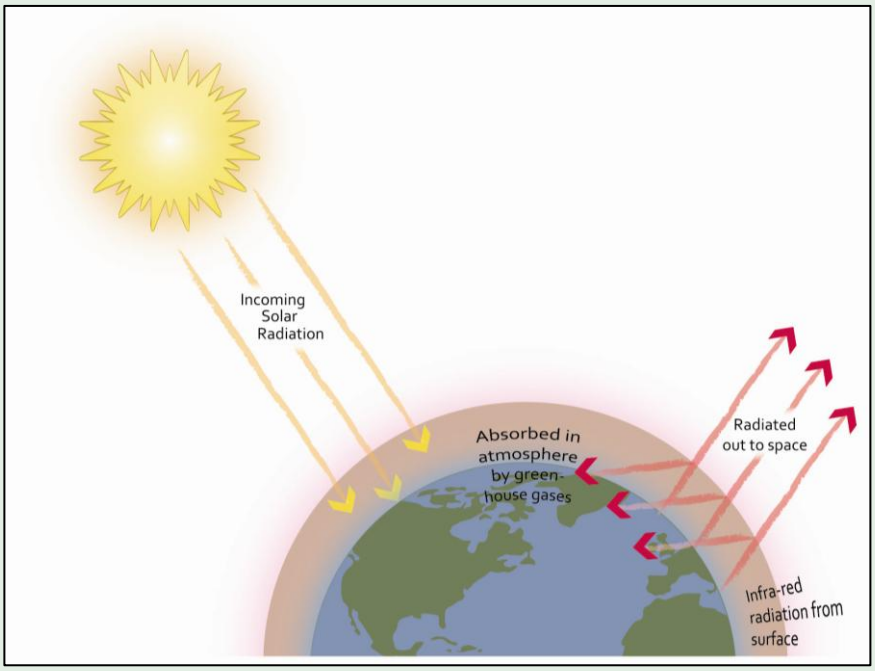
This release of gases, such as carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$), creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space (Figure 2-1). While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of greenhouse gases beyond natural levels. The overabundance of greenhouse gases in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

[1] National Academy of Sciences 2008.



These gases function similarly to glass on a greenhouse; the glass panes of a greenhouse allow sunlight to pass into the building but trap heat within it, preventing the heat from escaping.[2]

**Figure 2-1.** The Greenhouse Effect




Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. 2008. *NOAA Satellite and Information Service.*

Without the greenhouse effect, the average global temperature would be zero degrees Fahrenheit, and life on earth would not be possible (National Oceanic and Atmospheric Administration, National Climatic Data Center 2008).

## GLOBAL CLIMATE CHANGE IMPACTS

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report's Working Group I Summary for Policymakers summarizes current scientific understanding of global climate change and projects future climate change using the most comprehensive set of recognized global climate models.[3] The report incorporates the current effects of global climate change and includes an increase in tropical cyclone intensity, a loss in seasonally frozen ground, and an increase in drought intensity.

The Intergovernmental Panel on Climate Change is an organization created by the United Nations Environmental Programme and the World Meteorlogical Organization to provide a global scientific view on the current state of climate change and its potential environmental and socio-economic impacts.

[2] National Oceanic and Atmospheric Administration, National Climatic Data Center 2008.

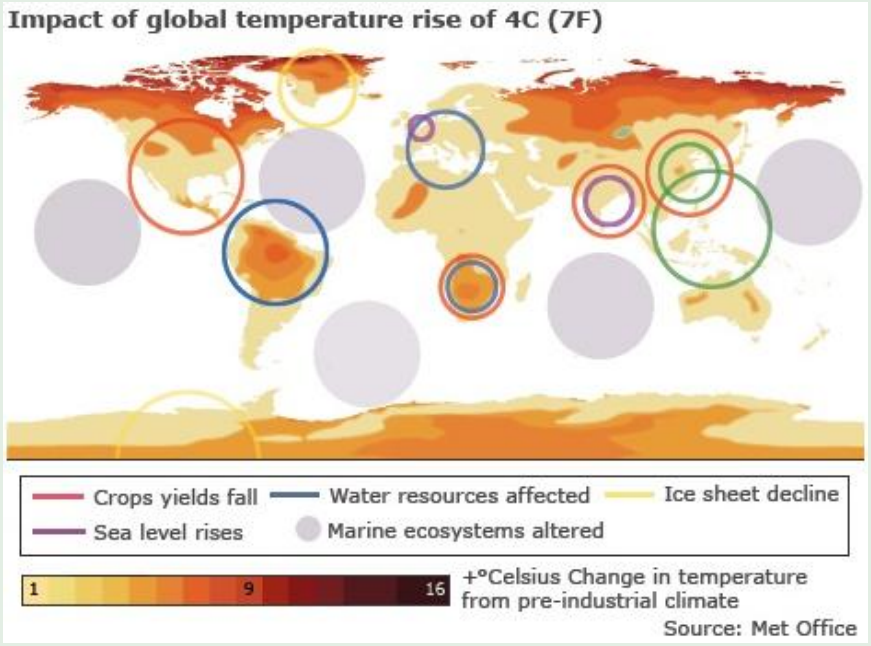
[3] IPCC 2007.



As asserted in the IPCC Fourth Assessment Report, if trends remain unchanged, continued GHG emissions above current rates will induce further warming changes in the global climate system and pose even greater risks than those currently witnessed. The impact of additional warming on the global climate is shown in Figure 2-2.

Given the scientific basis of climate change facts and expected trends, the challenge remains to prepare for and mitigate climate change through deliberate global and local action.

**Figure 2-2.** Potential Global Climate Change Impacts




Source: Met Office, Hadley Centre. 2009. *Mapping Climate Impacts.*

## CLIMATE CHANGE IMPACTS TO CALIFORNIA

Research suggests that California will experience hotter and drier conditions, reductions in winter snow and increases in winter rains, sea level rise, significant changes to the water cycle, and an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state. To refrain from action is costly and risky; the California

**Climate Change in California**

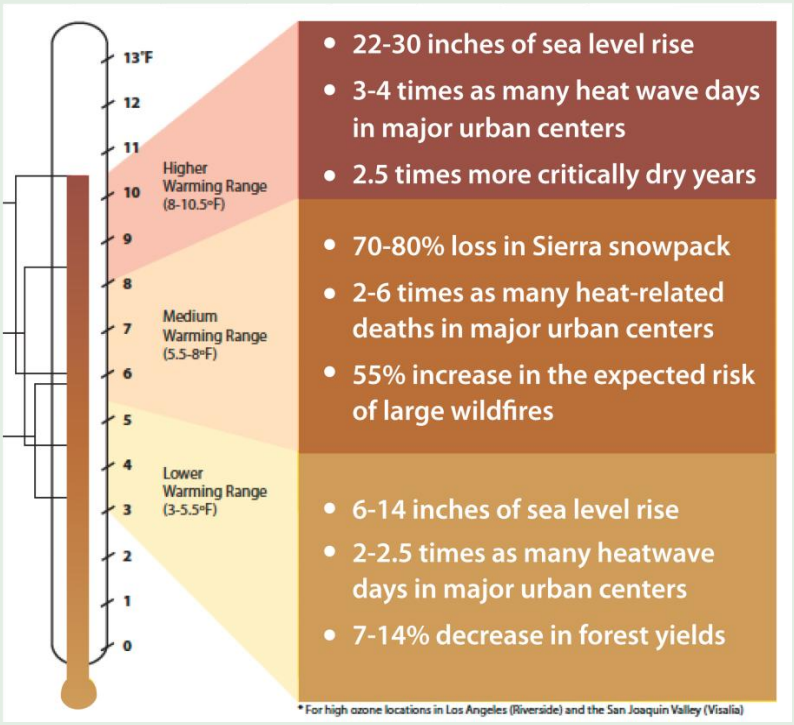
- hotter and drier conditions,
- reductions in winter snow and increases in winter rains,
- sea level rise,
- significant changes to the water cycle, and
- an increased occurrence of extreme weather events





Climate Adaptation Strategy estimates that no action to address the potential impacts of climate change will lead to economic losses of "tens of billions of dollars per year in direct costs" and "expose trillions of dollars of assets to collateral risk."[4] Potential impacts in California due to climate change are summarized in Figure 2-3.

**Figure 2-3.** California Climate Change Impacts, 2070-2099




Source: California Energy Commission. 2006. *Our Changing Climate: Assessing the Risks to California.* Web Document. Sacramento, CA: California Energy Commission.

### Increased Rate of Wildfires

Wildfire risk is based on a combination of factors including rainfall, winds, temperature, and vegetation. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. Even under the "medium" warming scenario predicted by the Intergovernmental Panel on Climate Change, wildfire risk will likely increase by 55% in

[4] California Natural Resources Agency 2009.



California.[5] Further, as wildfires increase in frequency and size, they will also increase in intensity.[6]

### Negative Impacts on Wildlife

As temperatures rise, species are moving north in California or to higher elevations. This migrational change disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change. Those species that are unable to migrate face the danger of extinction: "The amount of future warming expected in California may likely exceed the tolerance of endemic species (i.e., those that are native to a specific location and that only occur there) given their limited distribution and microclimate."[7]

Reduction in soil moisture will result in early dieback of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but with a limited ability to adapt to new climates, the potential for severe species loss is present.

Several potential hydrological changes associated with global climate change could also specifically influence the ecology of aquatic life in California and have several negative effects on cold-water fish. For example, if a rise in air temperature by just a few degrees Fahrenheit occurs, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp. Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults or juveniles or both[8].

[5] California Natural Resources Agency 2009.

[6] California Natural Resources Agency 2009.

[7] California Natural Resources Agency 2009.

[8] California Natural Resources Agency 2009.





**Improving Public Health**

This symbol indicates that a GHG reduction measure will have a beneficial impact on public health.

### Deteriorating Public Health

Heat waves are expected to have a major impact on public health, as well as decreasing air quality and increasing mosquito breeding and mosquito-borne diseases. Further, climate change is expected to alter the spread and prevalence of disease carrying insects, organisms, or people, referred to as vectors, in addition to leading to a possible decrease in food quality and security.[9] Vector control districts throughout the state are already evaluating how they will address the expected changes to California's climate.

According to a new report from the Air Resources Board, the warming climate will increase ozone levels in California's major air basins, leading to upwards of 6 to 30 more days per year with ozone concentrations that exceed federal clean-air standards.

Cost-effective measures to reduce greenhouse gas emissions and protect public health are important for local governments. The new Air Resources Board study provides evidence of what is becoming known as the "climate penalty," where rising temperatures increase ground-level ozone and airborne health-damaging particles, despite the reductions achieved by programs targeting smog-forming emissions from cars, trucks, and industrial sources.[10] The elderly, young, and sensitive populations most likely to be impacted by climate change are also those that often lack sufficient resources to adapt. Such vulnerable demographics are likely to need assistance to respond to climate change. Social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on local governments.

### Decreased Supply of Fresh Water

The state's water supply is already under stress and is anticipated to shrink under even the most conservative climate change scenario. Warmer average global temperatures cause more rainfall

[9] California Natural Resources Agency 2009.

[10] California Natural Resources Agency 2009.

than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpack melts in the spring. The Sierra snowpack is estimated to experience a 25 to 40% reduction from its average by 2050.[11] With rain and snow events becoming less predictable and more variable, the rate of flooding could increase and California's ability to store and transport fresh water for consumption could decrease. Further, warmer weather will lead to longer growing seasons and increased agricultural demand for water.[12]

### Increased Severity and Frequency of Flood Events

Forecasts indicate more intense rainfall events, generating more frequent or extensive runoff, and flooding may result from a changing climate. Localized flood events may increase in periods of heavy rain. As explained by the Climate Adaptation Strategy, California's water system is structured and operated to balance between water storage for dry months and flood protection during rainy seasons.[13] Although climate change is likely to lead to a drier climate overall, risks from regular, more intense rainfall events can generate more frequent and/or more severe flooding that upsets this managed balance between storage and protection. Additionally, erosion may increase and water quality may decrease as a result of increased rainfall amounts.

## STATE CLIMATE ADAPTATION EFFORTS

Many state and regional entities are well under way in their effort to address climate change impacts. Existing efforts include detailed vulnerability assessments, risk assessments, adaptation policies, and adaptation policy guides for local governments. Current efforts include the following:



**CAL Adapt**

CAL Adapt is a tool created by the California Energy Commission's Public Interest Energy Research Group to provide local governments with tools and resources to address climate change impacts.

[11] California Natural Resources Agency 2009.

[12] California Natural Resources Agency 2009.

[13] California Natural Resources Agency 2009.



- **Executive Order S-13-08** – Signed in 2008, the executive order requires the preparation of a California Sea Level Rise Assessment Report and requires state agencies consider and address a range of sea level scenarios for 2050 and 2100 inundation. Lastly, the order requires development of the Climate Adaptation Strategy (CAS).
- **California Climate Adaptation Strategy** – The CAS summarizes the best-known science on climate change impacts and provides recommendations on how to manage the risks.
- **Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water** – A report by the Natural Resources Agency on climate change impacts to California's water system.

## CLIMATE CHANGE PROJECTIONS AND IMPACTS TO SAN LUIS OBISPO COUNTY

Potential Climate Change projections and impacts are summarized in Chapter 7 of this Plan and are accompanied by the County's existing efforts and new measures to prepare for the potentially negative impacts that climate change may occur in San Luis Obispo County.

## LEGISLATIVE BACKGROUND & REGULATORY FRAMEWORK

While the federal government has yet to enact legislative targets for reducing greenhouse gas emissions, California was the first state in the nation to adopt GHG emissions reduction targets in 2006 under Assembly Bill 32 (AB 32), This section highlights the federal, state, and local legislative framework guiding the preparation and implementation of this Plan.



## Federal Framework

Though current federal government regulations lack strict emissions reduction targets, there are a variety of ways that the federal government is supporting emissions reduction efforts of state and local governments. Numerous proposals are currently under way at the federal level to limit emissions from power plants, impose pricing on carbon emissions, and provide federal energy legislation.

Although federal agencies do not have regulatory control over GHG emissions, there is an effort to assist state and local governments, businesses, and residents with efforts related to energy, climate action planning, and smart growth. The Environmental Protection Agency (EPA) also provides educational resources and analytical tools in support of GHG analysis and climate action planning.

### *Clean Air Act*

Under the Clean Air Act (CAA), the EPA is required to regulate and set emissions standards for "any air pollutant" from motor vehicles which have the potential to endanger public health or welfare. In 2003, the EPA made the determination that it lacked the authority to regulate carbon dioxide and other greenhouse gas emissions for the purpose of climate change.[14] Following this determination, a group of 12 states (including California), three cities, and one American Territory, along with more than a dozen individual organizations appealed the EPA's decision to the U.S. Court of Appeals in the case of *Massachusetts v. Environmental Protection Agency*. The decision was upheld by the lower courts and appealed up to the Supreme Court, where the 5–4 decision was made to force the EPA to treat and regulate carbon dioxide and other greenhouse gases as pollutants under the Clean Air Act.[15]

Beginning in 2011, the EPA will regulate GHG emissions from new power plants and refineries through a set of New Source

[14] United States Environmental Protection Agency 2003.

[15] Massachusetts et al. v. Environmental Protection Agency et al. 2007.



Performance Standards (NSPS). These regulations will be finalized and applied to all new stationary sources by 2012.

### *American Reinvestment and Recovery Act – Energy Efficiency and Conservation Block Grants*

In addition to the EPA's regulatory authority to manage greenhouse gas emissions, the 2009 American Reinvestment and Recovery Act (ARRA) package has supported state and local government investment in greenhouse gas reduction activities through Energy Efficiency and Conservation Block Grant (EECBG) funding. The EECBG program, managed under the U.S. Department of Energy, has provided a total of $3.2 billion to cities and counties across the U.S. to invest in energy efficiency and reduce fossil fuel use from the building and transportation sectors, thereby reducing greenhouse gas emissions.

## California Legislative Framework

The State of California is the 15th largest emitter of greenhouse gases in the world, ultimately accounting for 2% of global greenhouse gas emissions.[16] However, the State has been proactive in working to reduce emissions and has a long history of proven leadership in addressing energy and climate issues spanning the last 40 years. In 1988, Assembly Bill 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for climate change issues in California.[17] Since that time, there have been numerous initiatives in California to address climate change and energy efficiency, the majority of legislation passed between 2000 and now. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created ambitious targets and regulations that will directly lead to reductions in greenhouse gas GHG emissions. Not only have California's efforts earned it a role as the leader in the United States for climate

[16] California Air Resources Board, California Climate Action Registry, and ICLEI 2008.

[17] California Energy Commission 2009.

planning strategies, but the state has received world attention and accolades for its efforts.

### *California Legislation*

California legislation related to climate change includes Executive Order S-3-05, Assembly Bill 32, and Senate Bill 375, which direct the State and other local agencies to reduce GHG emissions. These orders and laws are summarized below:

**Executive Order S-3-05** establishes the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the progressive greenhouse gas emissions reduction targets outlined in the executive order for the state:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020 reduce greenhouse gas emissions to 1990 levels;
- By 2050, reduce greenhouse gas emissions to 80% below 1990 levels.

**Assembly Bill 32,** known as the California Global Warming Solutions Act, was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.[18] Mandatory actions under the legislation to be completed by CARB include:

- Identification of early action items that can be quickly implemented to achieve greenhouse gas reductions. These early action items were adopted by the California Air Resources Board in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.



The County's goal to reduce GHG emissions 15% below 2006 baseline levels by 2020 is consistent with State direction to reduce 2020 emissions to 1990 levels.

[18] California Air Resources Board 2010.



- Development of a scoping plan to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The scoping plan employs a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program.

- Creation and adoption of regulations to require the state's largest industrial emitters of greenhouse gases to report and verify their greenhouse gas emissions on an annual basis.

**Senate Bill 375** builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires metropolitan planning organizations (MPOs), like the San Luis Obispo Council of Governments (SLOCOG), to create Sustainable Communities Strategies (SCSs) in their regional transportation plans (RTPs) for the purpose of reducing urban sprawl. The SCS will demonstrate how the region will achieve the greenhouse gas emissions reduction target set by CARB for 2020 and 2035.

In addition to Executive Order S-3-05, AB 32, and SB 375, the State has enacted legislation related to climate change, transportation and vehicle efficiencies, energy, water, and solid waste. A summary of recent state efforts by topic is provided below in Figure 2-4.



## Figure 2-4. California Regulatory Framework

### Climate Change

**E.O. S-3-05** — 2005 - Establishes the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the progressive greenhouse gas emissions reduction targets outlined in the executive order for the state.

**AB 32** — 2006 - The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.

**SB 97** — 2008 - Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act (CEQA).

### Transportation and Vehicles

**AB 1493** — 2002 - Commonly referred to as the Pavley standards, AB 1493 directed CARB to create regulations that would lead to reductions in greenhouse gas emissions from passenger vehicles, light-duty trucks, and noncommercial vehicles sold in California.

**E.O. S-1-07** — 2007 - Known as the Low Carbon Fuel Standard, Executive Order S-1-07 establishes a goal to reduce the carbon intensity of California's transportation fuels by 10% by 2020.

**SB 375** — 2008 - Requires the California Air Resources Board to establish GHG reduction targets for each metropolitan planning organization (MPO) in California and directs each MPO to develop a Sustainable Communities Strategy.



## Energy

**Title 24** — Title 24 Standards were first adopted in 1978 and established minimum energy efficiency performance standards for residential and nonresidential buildings. Since then, the standards have been continually updated to reduce California's energy consumption.

**SB 1078** — 2002 - Established Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs) to acquire 20% of their electricity from renewable resources by 2010 and 33% by 2020.

**SB 1368** — 2006 - Establishes emissions performance standards for new and existing power plants that produce energy that is sold to publicly owned and investor-owned utilities.

**AB 811** — 2008 - Authorized all cities and counties in California to designate areas within which willing property owners could finance the installation of distributed renewable generation, as well as energy efficiency improvements through low-interest loans.

## Water

**SB 1881** — 2006 - Requires cities and counties to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

**SB 7** — 2009 - Requires the State to achieve a 20% reduction in per capita water use by 2020. Noncompliance by local water providers will make them ineligible for state grant or loan funding from the State.

**SB 407** — 2010 - Targets inefficient plumbing fixtures to be upgraded. Requirements for compliance are phased in depending on the property type, with all single-family, multi-family, and non-residential properties complying by 2019.



**Solid Waste**

| | |
|---|---|
| **AB 939** | 1989 - Established the goal of achieving a statewide diversion rate of 50% and requires cities and counties to divert a minimum of 50% of their waste stream for reuse or recycling. |
| **SB 1016** | 2008 - Established per capita disposal rate requirements and goals for local agencies in California. Requirements are expressed in a pounds per person per day measurement. |

### *State Guidance and Reports on Climate Change*

**AB 32 Scoping Plan** – In 2008, CARB approved the AB 32 Scoping Plan outlining regulatory and market mechanisms to achieve the goal of AB 32. The plan cites local government action as an integral partner to achieving the State's goals.

**California Climate Adaptation Strategy** – In 2009, the California Natural Resources Agency released the California Climate Adaptation Strategy as a guide to both state and local agencies on appropriate strategies to adapt to climate change impacts that may negatively affect the State's population and natural resources. The guide includes adaptation strategies for public health, biodiversity, ocean and coastal resources, water management, agriculture, forestry, transportation, and energy infrastructure sectors.

**SB 97-CEQA Guideline Amendments** – The State Resources Agency adopted guidelines developed by the Governor's Office of Planning and Research (OPR) to address climate change in CEQA documents, per SB 97. The Guidelines outline the approach to structuring plans for reduction GHG emissions to serve as tiering documents.



### SLO County Existing Efforts

In 2005, the County adopted Strategic Growth Principles, which serve as guiding principles on how the county's new growth will occur in a more sustainable manner. These Principles have been incorporated as goals, policies, and strategies into the General Plan.

In May 2010, the County Board of Supervisors adopted an update to the Conservation and Open Space Element (COSE) of the County's General Plan. The updated COSE provides the basis and direction for much of this Plan with goals and policies that aim to reduce vehicle miles traveled, conserve water, increase energy efficiency and the use of renewable energy, and reduce greenhouse gas emissions.

Many of the air pollution programs already in place throughout the county were created to reduce ozone-forming pollutants and toxic emissions, but the programs also have the added benefit of reducing greenhouse gas emissions. The County, cities, and the Air Pollution Control District (APCD) implement rules and regulations, clean fuel programs, mitigation programs, grants, ridesharing, pollution prevention activities, energy efficiency and conservation measures, water conservation programs, partnerships, and public outreach that directly or indirectly address climate change and reduce greenhouse gas emissions.



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# 3 – GREENHOUSE GAS EMISSIONS INVENTORY

# INVENTORY BACKGROUND & METHODOLOGY



In 2010, the County of San Luis Obispo approved the 2006 Baseline GHG Emissions Inventory (Inventory) as part of the County's update of the Conservation and Open Space Element of the General Plan. The Inventory, prepared in 2009, identifies the major sources of GHG emissions within the unincorporated county[1] and from County government operations, and provides a baseline against which future progress can be measured.

The Inventory uses the baseline year of 2006 because of the availability of reliable data. The State of California uses 1990 as a reference year to remain consistent with the Kyoto Protocol and also because the AB 32 Scoping Plan has well-kept records of transportation trends and energy records in that year.

GHG emissions from County government operations were calculated following the Local Government Operations Protocol, which has been developed and continually updated by the California Air Resources Board (CARB), ICLEI – Local Governments for Sustainability (ICLEI), and The Climate Registry (TCR). Currently there is no standard protocol for calculating GHG emissions from community-wide sources. There are sources of GHG emissions (e.g., refrigerants and water reservoirs) that contribute GHGs, but these are difficult or impossible to calculate at the local level. Furthermore, it is likely that new methodologies will be developed to assess additional sources of GHGs in the future and that our method of calculating present emissions will change as technology and science develop. Both the County government operations and community-wide baseline inventories were calculated using the Clean Air and Climate Protection (CACP) Software developed by ICLEI in partnership with the National Association of Clean Air Agencies (NACAA) and Torrie Smith Associates.

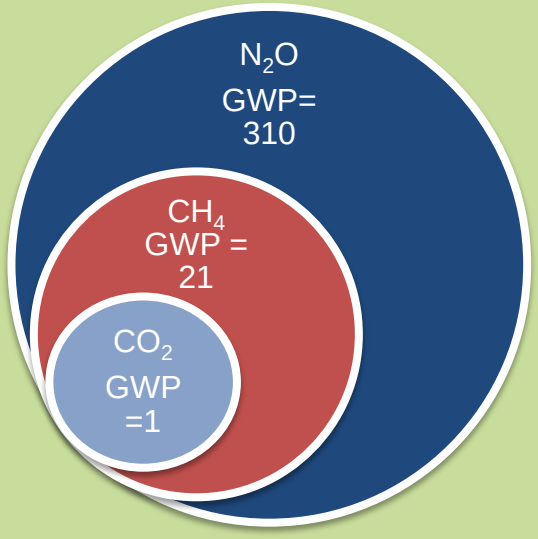
The County's Baseline GHG Inventory was calculated using the Clean Air and Climate Protection Software developed by ICLEI in partnership with the National Association of Clean Air Agencies (NACAA) and Torrie Smith Associates.

[1] In this report the term "county" refers to the area inside the jurisdictional boundary of San Luis Obispo County, whereas "County" refers to those activities which are under the operational control of County agencies.



The Inventory measures three primary GHG emissions—carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$)—as defined in Chapter 2 of this Plan. These greenhouse gases are then converted to carbon dioxide equivalents ($CO_2e$), enabling the County to consider different greenhouse gases in comparable terms. The conversion of greenhouse gases is done by comparing the global warming potential (GWP) of each gas to $CO_2$. For example, methane ($CH_4$) is 21 times more powerful than $CO_2$ on a per weight basis in its capacity to trap heat, and therefore one metric ton of $CH_4$ would be calculated as 21 $MTCO_2e$, while nitrous oxide ($N_2O$) is 310 times more powerful than $CO_2$ (see **Figure 3-1**).

**Figure 3-1.** Global Warming Potentials of $CO_2$, $CH_4$, and $N_2O$*




**Note: This figure is not drawn to scale.*

## Inventory Structure

The Inventory is split into a community-wide baseline inventory, detailing the sources of emissions from activities within the unincorporated areas of San Luis Obispo County, and a County operations baseline inventory, determining the sources and quantities of GHG emissions from activities on County-owned or -operated property or by County employees.

The community-wide baseline GHG inventory has been divided into six sectors, or sources of emissions. Sources of GHG emissions for the community-wide inventory include residential energy use, commercial and industrial energy use, on-road transportation, solid waste, agriculture (livestock, fertilizer, and off-road agriculture equipment), and aircraft. Calculating GHG emissions by sector allows the County to align emissions reduction programs with the largest sources of emissions, making the Inventory an integral component of the County's sustainability efforts.

The County government operations inventory provides a more detailed analysis of the County's streetlights, building energy use, fleet vehicles, waste disposal, and more. Conducting a more in-depth analysis of County operations by individual facility or vehicle allows the County to incorporate potential emissions reductions into

budget and capital improvement decisions when upgrading County facilities or purchasing new vehicles.

### Data Collection and Methodology

Creating the community-wide and County government operations emissions inventories required the collection of data from a variety of sources. Data sources for both inventories include:

**Community-Wide Inventory Data Sources**

- Pacific Gas & Electric Company (PG&E)
- Southern California Gas Company
- California Integrated Waste Management Board
- San Luis Obispo Air Pollution Control District
- SLO County Department of Agriculture
- California Air Resources Board
- Fehr & Peers

**County Government Operations Inventory Data Sources**

- Pacific Gas & Electric Company (PG&E)
- Southern California Gas Company
- SLO County General Services Agency
- SLO County Sheriff's Department
- SLO County Planning Department
- SLO County Public Works Department
- SLO County Fire Department (Cal Fire)

For community activities and government operations, emissions sources are categorized by scope. Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are illustrated in **Figure 3-2** and are defined as follows:

- **Scope 1** – Direct emissions sources located within the unincorporated areas of the county, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas. GHG emissions from off-road agriculture equipment and nitrogen fertilizer application are considered Scope 1 emissions.



**What is a Scope?**

Scopes help us to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures.

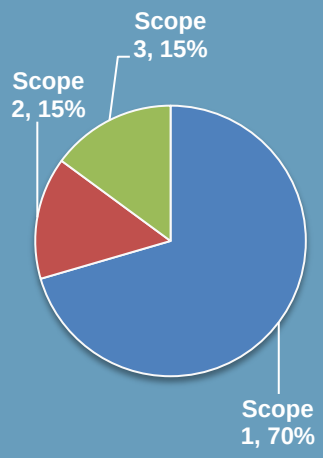
Scope 1 emissions come from the combustion of fuels such as gasoline or natural gas.

Scope 2 are indirect emissions from purchased electricity used in the unincorporated county.

Scope 3 are all other indirect emissions sources including methane from solid waste, crop fertilization, or other sources of emissions.



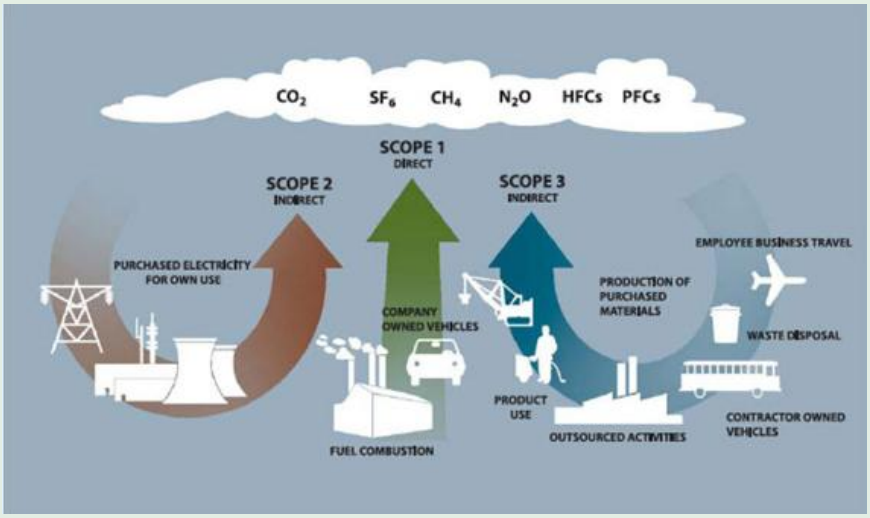
**San Luis Obispo County's Emissions by Scope**




- **Scope 2** – Indirect emissions that result because of activities in the unincorporated areas of the county and limited to electricity, district heating, steam and cooling consumption. Scope 2 emissions sources include purchased electricity used in the unincorporated areas and associated with the generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community's electricity consumption.

- **Scope 3** – All other indirect emissions that occur as a result of activity in the unincorporated areas. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside of the unincorporated areas of the county. Methane emissions from livestock are considered Scope 3.

**Figure 3-2.** GHG Emissions by Scope




Source: New Zealand Business Council for Sustainable Development. 2002. The Challenge of GHG Emissions: The "why" and "how" of accounting and reporting for GHG emissions: An Industry Guide

### Data Limitations

The Inventory was developed with the best-available tools, data, and methodology; however, as with any GHG inventory, there are limitations to representing all sources of emissions in a local

jurisdiction. The main factors that limit GHG inventories include (1) data availability, (2) privacy laws, and (3) a lack of a reasonable methodology. The following sections highlight emissions that cannot be included in a GHG inventory due to the factors listed above.

### Data Availability

Lack of available data prevented the calculation of emissions from the following sources for the following reasons:

- **Rail and port emissions** –The California Air Resources Board OFFROAD 2007 software provides emissions from rail and port activities. However, these numbers are aggregated for the entire San Luis Obispo County area, which includes incorporated, unincorporated, and state or federally owned land. Without data specific to unincorporated areas and without a reasonable methodology for attributing these activities to the unincorporated areas within the county, these emissions cannot be accurately included in the community-wide GHG inventory.

- **Propane use** – Propane is essentially an unregulated fuel in California (except for storage and safety issues, which are regulated). Because it is an unregulated commodity, no data is collected by the State on propane sales or usage. Collecting propane usage data at the local level would be difficult and, since it is not a required part of an inventory, it is not included.

- **Refrigerants** – Similar to propane, above, the amount of fugitive refrigerant emissions cannot be calculated because sales are not tracked.

### Privacy Laws

A California Privacy law, known as the 15/15 rule, require commercial and industrial electricity and natural gas to be aggregated when released to the County for analysis. The California 15/15 rule was adopted by the California Public Utilities



The main factors that limit GHG inventories include:

1. Data Availability
2. Privacy Laws
3. Lack of Reasonable Methodology



Commission in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality by requiring that any disaggregated information provided by the utilities must include at least 15 customers and that a single customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released.

Privacy laws such as California's 15/15 rule limit the release of certain energy data if there are less than 15 customers or any single customer accounts for more than 15% of the sectors total energy use.

### Life-Cycle Emissions

A lack of a reasonable methodology prevents estimation of life-cycle emissions for the community. Life-cycle emissions are emissions associated with the production and disposal of items consumed by a community (i.e., "cradle to grave"). For instance, a life-cycle assessment of vehicle emissions would include those from the design, extraction of raw materials, production, delivery, and disposal of each car in the county. In contrast, this Inventory only captures how much that car is driven in the county consistent with standard protocol.

Review of similar inventories, including the California Greenhouse Gas Inventory prepared by the California Air Resources Board (CARB), indicates that those sources not included in the Inventory for the reasons stated above comprise only a small portion of total emissions in the county. Once CARB adopts a community-wide protocol, it is likely that methodology and accessibility to data will improve. The emissions identified in this report are primarily GHGs that the community has directly caused and has the ability to reduce through implementation of conservation actions, a GHG reduction plan, or corresponding efforts.

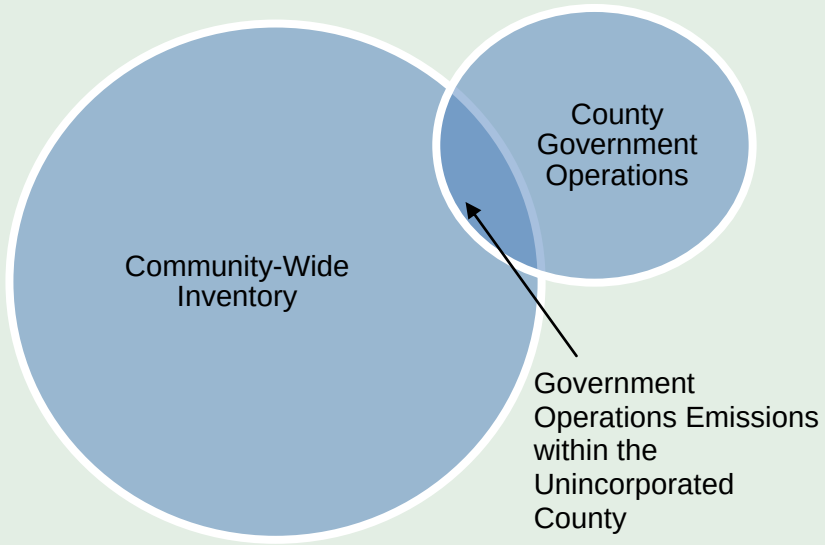
### Relationship Between the Community-Wide and County Operations Inventory

It is important to note that some of the County government emissions are a subset of the community-wide inventory, depending on the location of each facility and where the County's vehicles are used. Any County-operated facility located in the unincorporated areas of the county would be a subset of the community-wide



inventory, as the facility's energy use or waste disposal would be reported within the community-wide data. It is best to think of the two inventories as overlapping, where some of the County government operations emissions fall within the community-wide inventory, while the remaining emissions would fall into the GHG emissions inventories of the incorporated cities within the county.

**Figure 3-3.** Relationship Between Community-Wide and County Operations Inventory




For example, the County's main jail, located in the unincorporated area of the county, would be classified under the commercial/industrial energy use within the community-wide inventory, while the County Government Center, located in the City of San Luis Obispo, is included in the commercial/industrial energy use in the City of San Luis Obispo's community-wide inventory.

# GREENHOUSE GAS EMISSIONS INVENTORY UPDATE

### Purpose of the Update

In 2010, the community-wide and County operations inventories were updated as part of the Plan development to ensure that they utilize accurate information and up to date methodology. The government operations inventory has been updated to adhere to



the Local Government Operations Protocol version 1.1 released in May 2010 by CARB. Community-wide GHG inventories, unlike municipal GHG inventories, do not have a protocol to follow. Community-wide inventories instead rely on best practices and a draft international protocol named the International Local Government GHG Emissions Analysis Protocol (IEAP) version 1.0 developed by ICLEI. The community-wide inventory was revised to include up-to-date data for key sectors as discussed below.

## Revised Community-Wide GHG Inventory Sectors

### *Transportation*

The transportation sector of the community-wide inventory has been updated to provide a more accurate estimate of transportation emissions that the County has the ability to control. The original inventory analysis calculated emissions from vehicle miles in the jurisdictional boundaries of the unincorporated county using Caltrans Highway Performance Monitoring System data. This approach attributes all miles traveled on roadways in the unincorporated county, including through traffic where vehicles do not have an origin or destination within the unincorporated areas. The updated analysis utilizes the San Luis Obispo Council of Governments (SLOCOG) transportation demand forecast model to develop transportation-related GHG emissions data and vehicle miles traveled (VMT) for trips that have an origin and/or destination in the unincorporated county.

To refine this sector, a land-use-based approach was used to allocate vehicle trips and VMT to unincorporated San Luis Obispo County by weighting trips based on their origin and destination.

- Internal Trips: All VMT associated with trips made in the unincorporated county were attributed to the unincorporated county.
- Internal-External Trips: Half of the VMT associated with trips from an origin within the unincorporated county and a destination outside of the unincorporated county.



- External-Internal Trips: Half of the VMT associated with trips from an origin outside of the unincorporated county and a destination within the unincorporated county.
- External-External Trips: Trips through unincorporated San Luis Obispo County without an origin or destination within the unincorporated county are not included.

Appropriating VMT and vehicle trips to the unincorporated county using this method resulted in 660 million miles of vehicle travel in 2006.

Annual VMT was then analyzed to determine GHG emissions from vehicle travel using the Emissions Factor (EMFAC) 2007 model developed by the California Air Resources Board. EMFAC 2007 uses emissions rates for different types of vehicles in conjunction with travel activity statistics to calculate vehicle based emissions in $MTCO_2$ per day. $MTCO_2$ per day is then converted into annual $MTCO_2e$ by multiplying daily emissions by 347 to account for reduced vehicle activity on weekends and multiplied by $100/95^2$ to convert $CO_2$ into $CO_2e$.

### *Agriculture – Crop Fertilizer*

In addition to the transportation sector update to the community-wide inventory, the "other" sector was also updated to include emissions from fertilizer application on agricultural land. Synthetic fertilizers are used to increase crop yields through increased input of nitrogen into the soils, which undergo two microbial processes that convert this nitrogen into nitrous oxide emissions.[3] The production of nitrous oxide is complex and affected by multiple factors, including temperature, moisture content, and oxygen concentrations in the soil.[4] Nitrous oxide ($N_2O$) contributes only a small percentage of total U.S. greenhouse gas emissions; however,

Nitrous oxide ($N_2O$) contributes only a small percentage of total U.S. greenhouse gas emissions; however, fertilizer application is one of the largest contributors to all $N_2O$ emissions.

[2] United States Environmental Protection Agency 2005.

[3] Paustian, et al. 2006.

[4] Snyder, et al. 2009.



fertilizer application is one of the largest contributors to all $N_2O$ emissions.

Agriculture plays a major role in the county's economy, with an annual crop yield worth an estimated $623 million in 2009[5]. Accurately accounting for emissions related to agriculture will help guide future policy decisions to reduce greenhouse gas emissions in balance with economic considerations in the agriculture sector. Due to the range of crops grown within the county, it was not feasible to gather fertilizer use data for each crop. Instead the 2006 San Luis Obispo County Crop Report was used to identify the top three crops by acreage (i.e., fruits and nuts, vegetables, and field crops).

The average amount of nitrogen fertilizer used in farming practices was identified with the assistance of the local Farm Advisor and the University of California Cooperative Extension's cost study reports. Utilizing both the local Farm Advisor and the UC Cooperative Extension data ensures that the data for average fertilizer application and nitrous oxide emissions was representative of local soil conditions and microclimates within the county.

**Aircraft – Landings and Take-offs**

The emissions within the "other" sector for aircraft account for emissions associated with aircraft landings and take-offs at the San Luis Obispo County Regional Airport and the Oceano County Airport, the two commercial and general aviation facilities located within the unincorporated areas of San Luis Obispo County.

Following the completion of the initial 2006 community-wide baseline inventory, the Airport Cooperative Research Program (ACRP) released the "Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories" in 2009.[6] The guidelines provide a methodology for inventorying GHG emissions related to aircraft and airport operations. While the report is intended to provide directions for conducting a facility-scale emissions inventory, the methodology

[5] County of San Luis Obispo, 2009.

[6] Transportation Research Board 2009.



can be adjusted to calculate community-wide Scope 3 emissions from aircraft landing and takeoff operations (LTO). The methodology used in this inventory diverges from ACRP guidelines in that it only includes emissions associated with the aircraft operations that directly impact air quality in the unincorporated county, and not the GHG emissions from aircraft through the duration of the flight. LTO operations are defined as the aircraft operations that occur below 3,000 feet in altitude, which is often considered the inversion layer level where emissions have a direct impact on the community's air quality.

Calculating emissions from aircraft landings and take-offs requires detailed information on the make and model, as well as engine types, of aircraft, and the annual number of landings and take-offs, all of which were provided in an engineering report prepared by SLO APCD in 2008. The number of landings and take-offs for each aircraft arriving and departing the San Luis Obispo County Regional Airport and the Oceano County Airport was entered into the Federal Aviation Administration's (FAA) Emissions and Dispersion Modeling System (EDMS)[7] to calculate the $CO_2$ emissions and fuel consumed during landing and take-off periods. Methane and $N_2O$ were calculated using the fuel coefficients provided by the ACRP guidebook and converted into $CO_2e$. In total, updates to the community-wide greenhouse gas emissions inventory provide a more accurate account of the GHGs emitted in 2006, but do not significantly change any sector's contribution to the total community-wide emissions total.

For additional details on the 2010 Inventory review and update, please refer to **Appendix A.**

### Updated 2006 Baseline Community-Wide Greenhouse Gas Emissions Inventory

The community-wide inventory with updated emissions sources provides the basis for developing the emissions reduction measures presented in this Plan. The inventory findings are presented in **Figure 3-3** and **Table 3-1.**

[7] Federal Aviation Administration Office of Environment and Energy 2009.

The primary sectors of GHG emissions are transportation (40%), commercial and industrial energy (24%), agriculture (off-road equipment, livestock, and crops) (18%), residential energy (15%), waste (3%), and aircraft (less than 0.1%).

**Figure 3-4.** Unincorporated San Luis Obispo County 2006 GHG Emissions

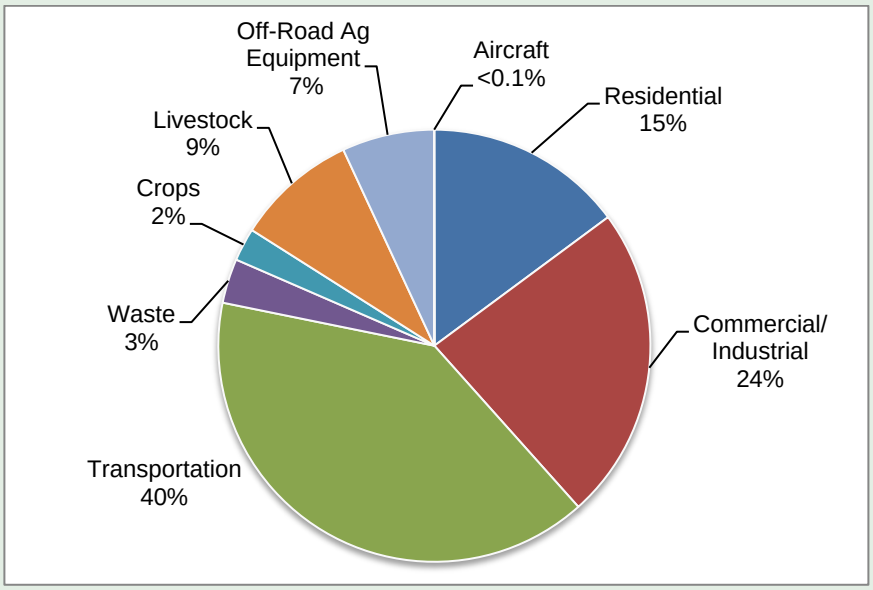



**Table 3-1.** Unincorporated San Luis Obispo County 2006 GHG Emissions

| | 2006 GHG Emissions ($MTCO_2e$) | Percentage of Total Emissions |
|---|---|---|
| Residential | 136,360 | 15% |
| Commercial/Industrial | 215,970 | 24% |
| Transportation | 365,260 | 40% |
| Waste | 30,540 | 3% |
| Other – Crops | 22,630 | 2% |
| Other – Livestock | 83,420 | 9% |
| Other – Off-Road Equipment | 63,280 | 7% |
| Other – Aircraft | 240 | < 0.1% |
| Total | 917,710 | 100%[1] |

1. Due to rounding, the sum of individual values may not equal the total given.



## Revised County Operations GHG Emissions Sectors

### *Employee Commute*

As part of Plan preparation, a peer review of the County government operations GHG emissions inventory was completed to ensure accuracy and update the inventory consistent with the Local Government Operations Protocol version 1.1, released in May 2010. As part of the peer review, the findings of the employee commute survey were updated. While the updated employee commute emissions are significantly less than the original inventory, the sector still accounts for the largest portion of the County's operational emissions. The updated County operations inventory findings are presented in **Figure 3-4** and **Table 3-2** below.[8]

## Updated County Operations GHG Emissions Inventory

The County operations inventory with updated emissions sources provides the basis for developing the emissions reduction measures presented in this Plan. The inventory findings are presented in **Figure 3-5** and **Table 3-2.**

The primary sectors of GHG emissions are employee commute (46%), buildings (30%), vehicle fleet (20%), water/sewage (2%), waste (2%), streetlights (0.4%), and other (<0.1%).

County Operations are inventoried and assessed because the County has financial and operational control to make changes to operations that will save the County energy and the taxpayers money.

[8] California Air Resources Board, California Climate Action Registry, ICLEI-Local Governments for Sustainability, and The Climate Registry 2010.

**Figure 3-5.** San Luis Obispo County Operations 2006 GHG Emissions

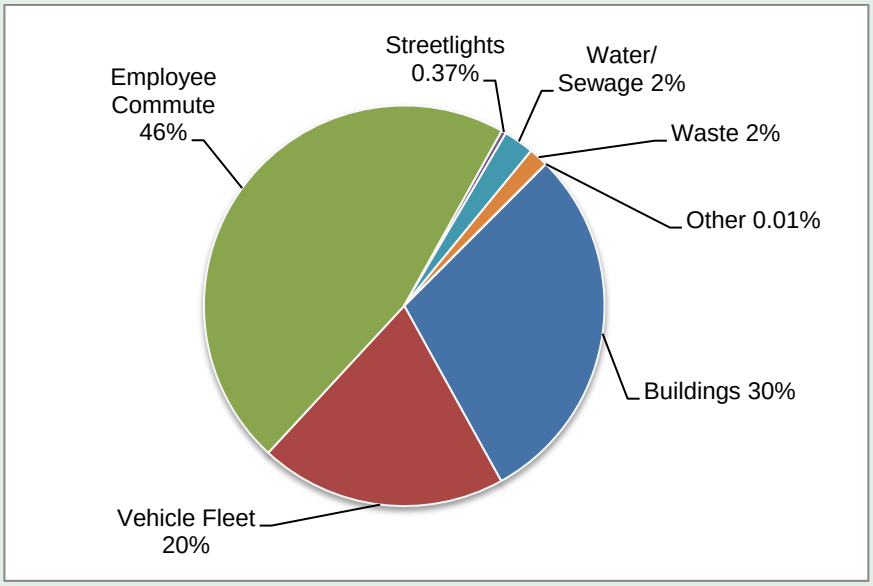



**Table 3-2.** San Luis Obispo County Operations 2006 GHG Emissions

| | 2006 GHG Emissions ($MTCO_2e$) | Percentage of Total Emissions |
|---|---|---|
| Buildings | 4,970 | 30% |
| Vehicle Fleet | 3,360 | 20% |
| Employee Commute | 7,800 | 46% |
| Streetlights | 60 | 0.4% |
| Water/Sewage | 410 | 2% |
| Waste | 270 | 2% |
| Other | <10 | <0.1% |
| Total | 16,870 | 100%[1] |

1. Due to rounding, the sum of all numbers may not add up to 100.0%.

The baseline inventories for both community-wide and County operations will be the basis for the GHG emissions forecasts and development of emissions reduction targets presented in Chapter 4.



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# 4 – GREENHOUSE GAS EMISSIONS FORECAST AND REDUCTION TARGETS

# GHG EMISSIONS FORECAST AND REDUCTION TARGETS

After conducting a 2006 baseline GHG emissions inventory, the County prepared a GHG emissions forecast for key target years. A GHG emissions forecast demonstrates the anticipated future conditions in comparison to the 2006 baseline year. As the County implements GHG reduction measures, it will be possible to compare actual emissions to projected emissions to track reduction progress.

The County selected 2020 as the forecast year or planning horizon for implementation of this Plan and achievement of the GHG reduction target. Selection of 2020 as the forecast year is also consistent with the State's forecast year established in AB 32. Emissions forecasting is conducted for emissions from community-wide and County government operations.

Why Forecast?

Future emissions forecasts are modeled based on projected growth trends in employment, population, vehicle miles traveled, and households to determine future GHG emissions levels in 2020 and 2035.

# COMMUNITY-WIDE FORECAST

The community-wide GHG emissions have been forecast to the year 2020 for consistency with state legislation (AB 32). For consistency with other County and regional planning efforts, a second reduction forecast year of 2035 is included in forecasts. The basis for all growth scenarios is a "business-as-usual" (BAU) projection. The BAU projection forecasts emissions to reflect the County's desired growth projections without regulatory or technical intervention to reduce GHG emissions. The BAU projection is then used as a starting point for the County to determine the level of emissions reductions needed to reach the reduction target.

### Indicators Used to Determine Future Emissions

Future emissions forecasts are modeled based on projected growth trends in employment, population, vehicle miles traveled (VMT), and households, among other indicators. The forecast relies on the San Luis Obispo Council of Governments (SLOCOG) Long-Range Planning Projections Data for 2020 and 2035 population and employment growth, as well as the projected land use patterns in the unincorporated areas of the county. **Table 4-1** shows the growth indicators used to determine community-wide emissions growth for each sector by 2020 and 2035. These indicators are then applied to the 2006 GHG emissions inventory to determine a business-as-

usual growth scenario. Under the business-as-usual scenario, community-wide emissions will grow by approximately 11% by the year 2020 and by 28% by 2035 (refer to **Table 4-2** and **Figure 4-1**).

**Table 4-1.** San Luis Obispo County Growth Indicators

| Growth Indicator | Source | 2006 | 2020 | 2035 | Sector | Percent Change from Baseline |
|---|---|---|---|---|---|---|
| Service Population | SLOCOG Long-Range Planning Projections | 117,570 | 137,870 | 160,300 | Waste Transportation | 36% |
| Households | SLOCOG Long-Range Planning Projections | 45,360 | 54,770 | 63,440 | Residential Energy | 40% |
| Employment | SLOCOG Long-Range Planning Projections | 15,680 | 18,790 | 22,640 | Commercial & Industrial Energy | 44% |
| Agricultural Land | SLO County Crops Report | 22,630 | 22,630 | 22,630 | Crop Fertilization | 0% |
| Livestock Population | SLO County Crops Report | 101,210 | 89,160 | 89,160 | Livestock | -12% |
| Aircraft Landings & Take-Offs | SLO County Regional Airport Environmental Impact Report | 74,950 | 79,010 | 80,170 | Aircraft | 6% |

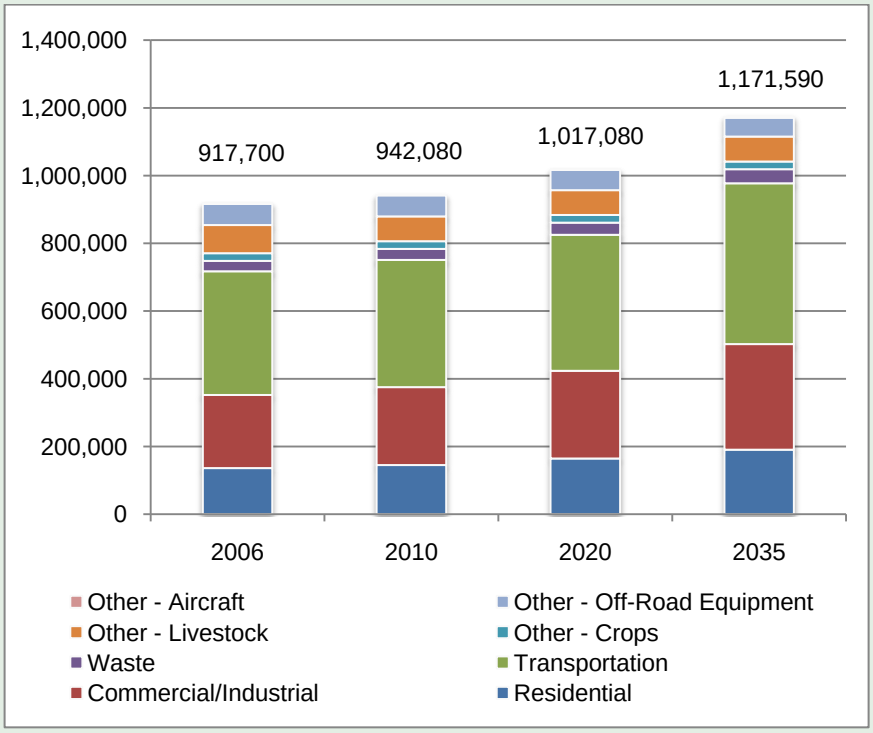
**Table 4-2.** Community Wide Business-as-Usual GHG Emissions Forecast ($MTCO_2e$)

| Sector/Source | | 2006 | 2020 | 2035 | Percent Change from Baseline |
|---|---|---|---|---|---|
| Residential | Electricity & Natural Gas | 136,360 | 164,640 | 190,710 | 40% |
| Commercial/ Industrial | Electricity & Natural Gas | 215,970 | 258,830 | 311,870 | 44% |
| Transportation | On-Road Vehicles | 365,260 | 401,790 | 474,840 | 30%[1] |
| Waste | Landfill Waste | 30,540 | 35,810 | 41,640 | 36% |
| Crops | Acres | 22,630 | 22,630 | 22,630 | 0% |
| Livestock | Head of Livestock | 83,420 | 73,490 | 73,490 | -12% |

| Sector/Source | | 2006 | 2020 | 2035 | Percent Change from Baseline |
|---|---|---|---|---|---|
| Off-Road Equipment[2] | Ag Equipment Vehicles | 63,280 | 59,640 | 56,160 | -11% |
| Aircraft | Landings & take-offs | 240 | 250 | 250 | 6% |
| **Total** | | **917,700** | **1,017,080[3]** | **1,171,590** | **28%** |

1. Transportation Emissions Factors are derived from the California Air Resources Board's EMFAC 2007 Software. While VMT is anticipated to grow 36%, EMFAC predicts slightly lower GHG emissions per mile of travel by 2035 due to regular turnover of vehicles resulting in just a 30% increase in transportation related GHG emissions
2. Off-Road Equipment is forecasted using the California Air Resources Board's Off-Road Software
3. Due to rounding, the sum of these numbers may not equal the total.

**Figure 4-1.** Community-Wide Business-as-Usual Emissions Forecast by Sector




# INCORPORATION OF STATE REDUCTIONS INTO FORECASTS

State-led or state-induced reduction strategies included in the AB 32 Scoping Plan are factored into the adjusted 2020 and 2035 emissions forecast. Strategies include all state actions that are

approved, programmed, and/or adopted and require no additional local action. Incorporating them into the forecast and reduction assessment to create an adjusted business-as-usual forecast provides a more accurate picture of future emissions growth and the responsibility of local governments once state measures to reduce GHG emissions have been implemented. A brief description of each of these items is provided below and summarized in **Table 4-3**. For more details on how State programs will affect the unincorporated County's GHG emissions, see Appendix E.

## Table 4-3. Summary of State Reductions Applied to Community-wide Emissions

| State Reductions Summary | 2010 ($MTCO_2e$) | 2020 ($MTCO_2e$) | 2035 ($MTCO_2e$) |
|---|---|---|---|
| Pavley Reductions | 0 | -53,800 | -100,660 |
| LCFS Reductions | 0 | -23,840 | -24,530 |
| RPS Reductions | -3,570 | -25,950 | -44,010 |
| CSI Reductions | -760 | -1,180 | -1,090 |
| Title 24 Reductions | 0 | -12,560 | -43,650 |
| Total State Reductions | -4,330 | -117,310[1] | -213,940 |

1. Due to rounding, the sum of these numbers may not equal the total.

**California's Pavley Standards**

Adopted in 2002, the Clean Car Standards, know as the Pavley Standard requires new vehicles sold in California starting in 2012 will be subject to higher fuel efficiency standards.

In addition to influencing community-wide GHG emissions, State Programs and policies will influence County operations GHG emissions, See **Table 4-4**. The renewable portfolio standard will reduce GHG emissions from all electricity use at County buildings, water and wastewater treatment facilities, irrigation controllers, and streetlights and traffic signals. The Clean Car Standards will reduce GHG emissions from the purchase of more fuel efficient vehicles for both the County fleet as well as employee vehicles used for commuting.

## Table 4-4. Summary of State Reductions Applied to County Operations Emissions

| State Reductions Summary | 2010 ($MTCO_2e$) | 2020 ($MTCO_2e$) | 2035 ($MTCO_2e$) |
|---|---|---|---|
| Pavley Reductions | 0 | -2,370 | -3,620 |
| RPS Reductions | -150 | -910 | -1,510 |
| Total State Reductions | -150 | -3,280 | -5,130 |

### Clean Car Standards, AB 1493 (Pavley)

Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency (EPA) granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.[1]

### Low Carbon Fuel Standard

Established in 2007 under an executive order from Governor Schwarzenegger, the Low Carbon Fuel Standard (LCFS) directs California Environmental Protection Agency, the California Energy Commission, and the California Air Resources Board to develop protocols for measuring the life-cycle carbon intensity of transportation fuels to be included as part of the State's early action item for implementing AB 32. LCFS will reduce the carbon intensity of transportation fuels by 10%.[2]

### Renewable Portfolio Standard

California's Renewable Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country, mandating that 33% of electricity delivered in California is generated by renewable sources like solar, wind and geothermal by 2020. The California RPS was first codified in 2002 by Senate Bill 1078 (requiring 20% renewable electricity mix by 2010) and further strengthened in April 2011 with the adoption of Senate Bill X 1-2 (requiring 33% renewable electricity mix by 2020).[3] The RPS intends to boost the economy and establish California as a center for the development and use of renewable energy. Only Hawaii's

[1] California Air Resources Board 2010.

[2] California Air Resources Board 2011.

[3] California Public Utilites Commision 2011.

electricity standard of 40% renewable by 2030 trumps California renewable energy standards.

Despite the 2020 goal of California's RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. In 2010, the California Public Utilities Commission reported that 18% of California's electricity came from renewable sources in 2010, missing the 20% goal by 2%. California utilities have more than enough renewable electricity under consideration to meet the 33% target by 2020. However, due to contract and transmission limitations, not all of this new electricity may be available by 2020.[4] Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

### California Building Codes, Title 24

Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. The 2010 triennial edition Title 24 applies to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This Plan focuses on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code or CALGreen Code. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

#### *Part 6, 2008 Building Energy Efficiency Standards*

The most recent update to Title 24 Part 6, the California Energy Code, went into effect on January 1, 2010 for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.

[4] California Public Utilites Commision 2011.

### *Part 11, 2010 California Green Building Code*

California is the first state in the nation to adopt a mandatory green building code, the California Green Building Standards Code, or CALGreen. The CALGreen Code was updated in 2010, and became a mandatory code beginning January 1, 2011. The Code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen code and may elect to adopt one of the two additional tiers. Local governments can adopt a Tier 1 or Tier 2 standard in order to achieve greater energy, water, and health benefits.

Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24 Part 6 standards. However, if a local government elects to adopt either of the tiers of CALGreen, additional prerequisites and electives must be implemented by new development projects subject to CALGreen. For the voluntary energy efficiency prerequisites, Tier 1 is a 15 % improvement and Tier 2 is a 30 % improvement over minimum Title 24 Part 6 requirements.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for on-going triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction. The County has adopted the minimum requirements of CALGreen and is currently preparing a Green Building Ordinance which will go beyond those minimum requirements and is described in more detail in **Chapter 5.**

### California Solar Initiative

The California Solar Initiative (CSI) was authorized in 2006 under Senate Bill (SB) 1 and allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities (IOUs): Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE). The CSI program has a budget of $2.167 billion to be expended by 2016 with a goal to reach 1,940 MW of installed power through out the state by that time.[5] The CSI program has several components including the Research and Development, Single-family Affordable Solar Housing (SASH), Multi-family Affordable Solar Housing (MASH), and Solar Water Heating Pilot Program, each of which provides incentives to further the development and installation of new solar technology on California's buildings.

## COUNTY OPERATIONS FORECAST

County government operations are more difficult to forecast separately due to a lack of reasonable growth indicators. In the absence of known growth indicators for sectors, the business-as-usual projection reflects baseline year emissions through 2020 and 2035. The forecast reflects changes in energy and transportation sectors to show anticipated changes to energy use related to water and wastewater treatment and distribution and changes to the County's employee population.

Other than water and wastewater emissions, where the County is anticipating the expansion or additional development of these facilities, a significant increase in emissions is not expected in County government operations emissions. Emissions from employee commute behaviors are directly tied to the number of County employees. Future GHG emissions associated with County employee vehicle miles traveled (VMT) were adjusted to reflect the anticipated changes in the number of employee as estimated by the Human Resources Department. Water and wastewater emissions were forecast to incorporate the Lopez Water Treatment Plant and

[5] California Energy Commission and California Public Utilities Commission 2011.

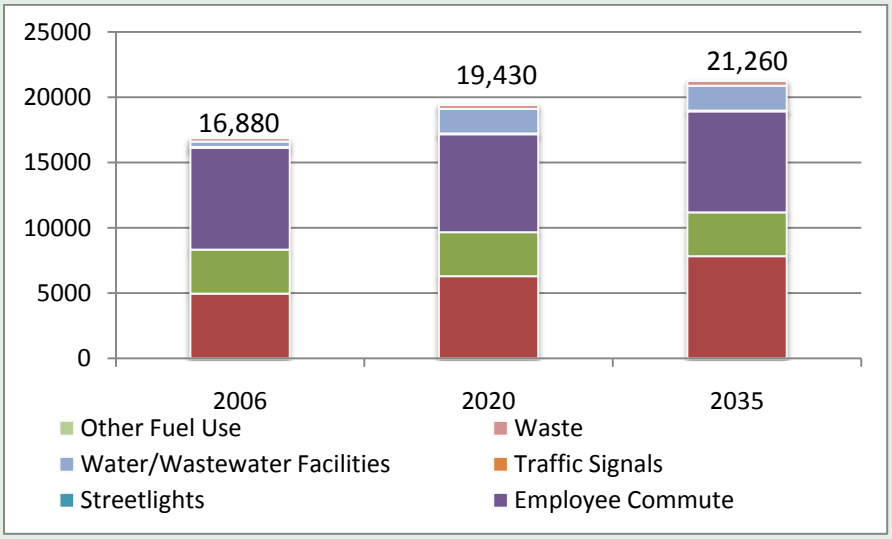
the Los Osos Wastewater Treatment Plant, both of which are anticipated to come on line within the next ten years. The forecast also reflects the potential change in operational control of the California Men's Colony wastewater treatment plant from the State of California to San Luis Obispo County. A summary of the projected future emissions of the County operations emissions in 2020 and 2035 is provided below in **Table 4-5** and **Figure 4-2**.

**Table 4-5.** Business-as-Usual Projected Growth in County Operations Emissions, 2006–2035 ($MTCO_2e$)

| Sector/Source | | 2006 | 2020 | 2035 |
|---|---|---|---|---|
| Buildings | Electricity & Natural Gas | 4,970 | 5,820 | 6,840 |
| Vehicle Fleet | Gasoline & Diesel Fuel | 3,360 | 3,360 | 3,360 |
| Employee Commute | VMT | 7,800 | 7,500 | 7,730 |
| Streetlights | Electricity | 50 | 50 | 50 |
| Traffic Signals | Electricity | 20 | 20 | 20 |
| Water/Wastewater | Electricity | 410 | 1,890 | 1,890 |
| Waste | Landfill Waste | 270 | 310 | 380 |
| Other Fuel Use | Propane Fuel | <10 | <10 | <10 |
| **Total** | | **16,880**[1] | **18,950**[1] | **20,270** |

1. Due to rounding, the sum of these numbers may not equal the total.

**Figure 4-2.** Business-as-Usual Projected Growth in County Operations Emissions, 2006–2035 (MTCO2e)



# GHG EMISSIONS REDUCTION TARGETS

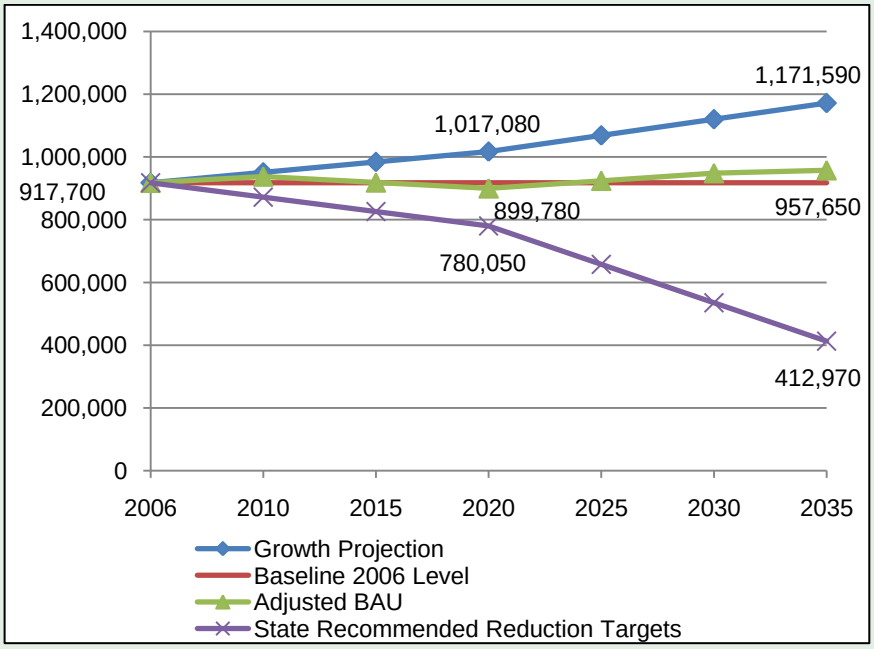
## Community-Wide Reduction Targets

### *Compliance with AB 32*

For consistency with the State's GHG reduction target as outlined in AB 32, the County set an emissions reduction target of 15% below 2006 levels by 2020. The County adopted the emissions reduction target in 2010 as part of the COSE. The County has not set reduction targets for other target years. The State's long-term goal to reduce emissions by 80% below 1990 emissions by 2050 is included in forecasts. **Figure 4-3** provides a comparison of the BAU forecast, the adjusted BAU forecast, and the emissions reduction targets for 2020 and 2035 to the 2006 baseline emissions to demonstrate the additional emissions reductions that will need to be achieved through implementation of local actions and programs.

**Figure 4-3** demonstrates how emissions will continue to increase along the adjusted BAU scenario. Achieving the reduction target will require an actual 28% decrease in emissions by 2020. By 2035, the gap between adjusted BAU emissions levels and the reduction target will grow to 52% as the target moves toward an 80% reduction in baseline emissions levels by 2050.

**Figure 4-3.** Comparison of Forecasts to Baseline and Reduction Target




### *Compliance with Other Adopted COSE Goals for Specific Sectors*

In addition to state-recommended reduction targets, the COSE includes the following goals and strategies that direct emissions reduction efforts for both community-wide and County operations emissions.

- Air Quality Goal 1: Per capita vehicle miles traveled countywide will be substantially reduced consistent with statewide targets.
- Air Quality Goal 4: Greenhouse gas emissions from County operations and community-wide sources will be reduced from baseline levels by a minimum of 15% by 2020.
- Energy Goal 5: Waste reduction, reuse, and recycling will achieve as close to zero waste as possible.
- Implementation Strategy E 5.1.1: Achieve Waste Diversion Rate. Create a waste reduction, reuse, and recycling program aimed at achieving a diversion rate of at least 70% by 2015 for the unincorporated county.

- Water Resources Goal 4: Per capita potable water use in the county will decline by 20% by 2020.

### County Operations Reduction Targets

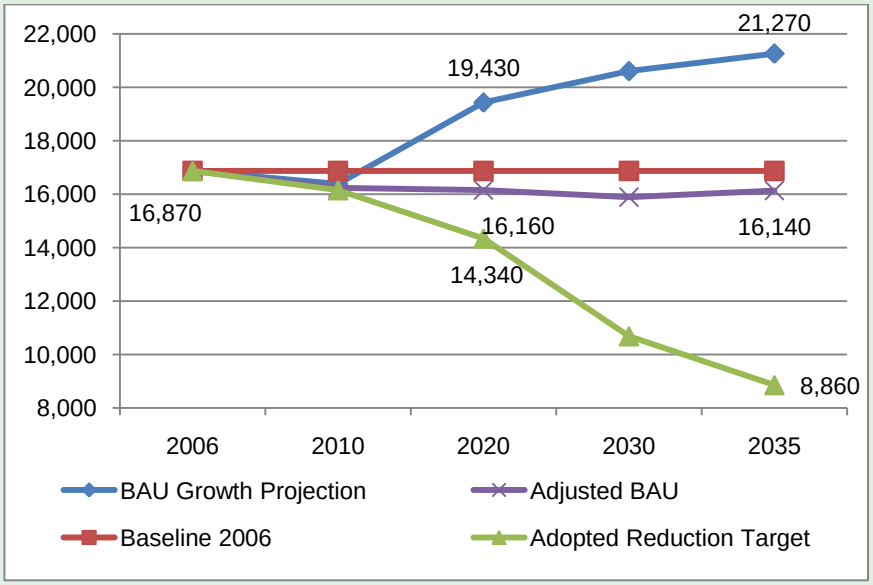
While the State has not directed local governments to reduce emissions from their own operations separate from community-wide emissions, the County has adopted an emissions reduction target consistent with the statewide goal of 15% below baseline levels by 2020 (COSE Air Quality Goal 4).

Implementation of the Local measures included in this Plan will help the County to reach GHG reduction targets for Community-wide and County operations by 2020.

**Figure 4-4** depicts the emissions reductions needed from County BAU to achieve the adopted reduction target. While County operations emissions decreased between 2006 and 2010 primarily due to a reduction in the number of employees, 2020 and 2035 emissions are still expected to grow beyond baseline levels under the business-as-usual scenario.

In order to meet the 15% below baseline levels by 2020 target, the County will need to reduce emissions by 4,6 $MTCO_2e$ from BAU emissions, or a 27% reduction in overall County operations emissions.

**Figure 4-4.** Comparison of County Operations Forecast to Baseline and Reduction Target



### *Adopted COSE Policies Related to County Operations*

In addition to the COSE air quality goal to reduce emissions from County operations baseline levels by a minimum of 15% by 2020, the COSE also includes an energy goal to reduce energy consumption at County facilities.

- Air Quality Goal 4: Greenhouse gas emissions from County operations and community-wide sources will be reduced from baseline levels by a minimum of 15% by 2020.
- Energy Goal 2: Energy consumption at County facilities will be reduced by 20% from 2006 levels by 2020.

The baseline inventory, emissions forecast, and reduction target, including COSE goals and policies, provide the framework for the GHG reduction measures provided in **Chapter 5**.

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# 5 – COMMUNITY-WIDE GREENHOUSE GAS REDUCTION MEASURES

# COMMUNITY-WIDE REDUCTION MEASURE SUMMARY



The EnergyWise Plan seeks to reduce community-wide GHG emissions 15% by 2020.

## Reduction Measure Topic Areas and Goals

To achieve the community-wide GHG emissions reduction target of 15% below 2006 baseline levels by 2020, the County will need to implement the reduction measures presented in this chapter. The reduction measures are organized by topic area and goal to align the reduction measures with the sources of GHG emissions, as presented in the GHG Inventory (Chapter 3). Reduction measure topic areas include:

- Energy conservation
- Renewable energy
- Solid waste
- Land use and transportation
- Water conservation
- Agriculture

Each topic area includes a goal, reduction measures, and supporting actions to demonstrate how the goals will be achieved. The goal summaries include a discussion of how each reduction measure contributes to the achievement of each goal.

## Reduction Measure Organization

### *Policy and Supporting Actions*

Each reduction measure includes the measure language, supporting actions, and a description of what the program will include. Many of the reduction measures will assist in the implementation of the COSE policies. The COSE policies that will be implemented through this Plan are listed with each measure.



### *Implementation*

An implementation table is provided for each GHG reduction measure. This table identifies key information critical to the successful implementation of each policy including the County agency responsible for the implementation of the measure, the time frame for implementation, ranges of the costs and savings that will be associated with the measure, and the indicators that will be used to measure progress. The time frame and costs/savings ranges used throughout this chapter are provided below.

| Time Frame | |
|---|---|
| Ongoing | Continual |
| Immediate | 0–1 Year |
| Near-Term | 1–5 Years |
| Mid-Term | 5–10 Years |
| Long-Term | 10+ Years |

| Costs/Savings | |
|---|---|
| Minimal | 0 |
| Low | $1–$100,000 |
| Low-Mid | $100,000–$500,000 |
| Medium | $500,000–$1,000,000 |
| Medium-High | $1,00,000–$5,000,000 |
| High | Over $5,000,000 |

### *GHG Emissions Reduction*

When sufficient information is available, emissions reduction measures have been quantified to indicate the contribution that a measure will have to overall GHG reductions. This number is presented in $MTCO_2e$ reduced per year. In some cases, the GHG reduction benefit is not quantifiable on its own but is included in another strategy. Other measures may not have a direct GHG reduction benefit but are critical to the success of other GHG reduction strategies.



### *Co-Benefits*

In addition to reducing GHG emissions, many measures will provide numerous co-benefits to the community while furthering the sustainability goals of the County. These co-benefits are depicted in this document through the following graphic symbols.

Look for the co-benefit symbols with each GHG reduction measure.

| | | | |
|---|---|---|---|
| **Conserves Energy** | | **Improves Air Quality** | |
| **Promotes Equity** | | **Improves Public Health** | |
| **Supports Local Economy** | | **Reduces Water Use** | |
| **Improves Mobility** | | **Provides Educational Opportunities** | |
| **Provides Monetary Savings** | | **Implements State Policy** | |

The assumptions, sources, and methodology used for each measure are provided in a detailed technical appendix (**Appendix C**). Additional information about the implementation of each measure is included in Chapter 8.




The focus of this goal is on improving the energy efficiency of buildings.

Implementation of energy conservation measures will not only reduce GHG emissions but will also reduce household and business costs associated with energy consumption.

## ENERGY CONSERVATION

### GOAL: ADDRESS FUTURE ENERGY NEEDS THROUGH INCREASED CONSERVATION AND EFFICIENCY IN ALL SECTORS.

Electricity and natural gas consumption support businesses, industrial facilities, and homes. Residents use natural gas to heat water and power natural gas cooking ranges. Industrial and commercial enterprises use natural gas for water heating in addition to on-site fuel combustion that supports manufacturing and industrial processes. Electricity powers appliances that are the cornerstones of daily life, from personal appliances to local infrastructure such as traffic signals. Greenhouse gas emissions are created by the consumption of electricity and natural gas. But greater efficiencies in existing levels of energy consumption can be realized while still supporting the needs of existing and future communities. Implementation of energy conservation measures will not only reduce GHG emissions but will also reduce household and business costs associated with energy consumption.

These measures target efficiencies in electricity and natural gas use in homes and nonresidential uses to reduce emissions. In San Luis Obispo County, where the majority of future GHG emissions will come from existing buildings, it is critical that this Plan include energy conservation measures that focus on improving the efficiency of existing buildings and ensuring that new construction projects utilize electricity and natural gas as efficiently as possible.

Since 2006, local utility providers like Pacific Gas and Electric (PG&E) and Southern California Gas have implemented several energy conservation outreach campaigns and developed programs to assist homeowners, businesses, and government agencies with implementing energy conservation measures within buildings. When possible, each measure includes an emissions reduction estimate for 2010 to demonstrate the progress already being made by businesses, homeowners, and government agencies to reduce energy consumption and save money.

When implemented, the eight GHG reduction measures focused on energy conservation will reduce GHG emissions in 2020 by 31,620 $MTCO_2e$ (Table 5-1) from residential and nonresidential energy use. GHG reductions from energy conservation measures account for 25% of the total emissions reductions from local actions by 2020 and 36% of total emissions reductions by 2035. These GHG reductions are in addition to the state policies associated with the implementation of Title 24 standards for new construction projects.



Local actions identified in this Plan will reduce energy use from electricity and natural gas by a total of 8% by 2035.

## **Table 5-1.** Energy Conservation GHG Reductions Summary

| # | Measure | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|---|
| 1. | Energy Conservation Programs | -860 | -2,870 | -4,100 |
| 2. | Low-Income Weatherization | 0 | -1,120 | -2,760 |
| 3. | Energy Efficiency Financing | 0 | -11,430 | -13,410 |
| 4. | Building Energy Scores | 0 | -9,580 | -29,250 |
| 5. | Workforce Training Programs | n/a | n/a | n/a |
| 6. | Smart Grid Technology | 0 | -7,930 | -13,180 |
| 7. | Energy-Efficient New Development | 0 | -3,780 | -9,460 |
| 8. | Community Forestry Program | -240 | -790 | -1,510 |
| **Total** | | **-1,100** | **-37,500** | **-73,670** |

Figure 5-1 and Figure 5-2 demonstrate how each reduction measure contributes to the overall goal of reducing emissions from energy consumption by 2020 and 2035.



75% of the houses in San Luis Obispo County were built before California's energy efficiency standards became more stringent in 1990.

**Figure 5-1.** 2020 Energy Conservation GHG Reduction Measures

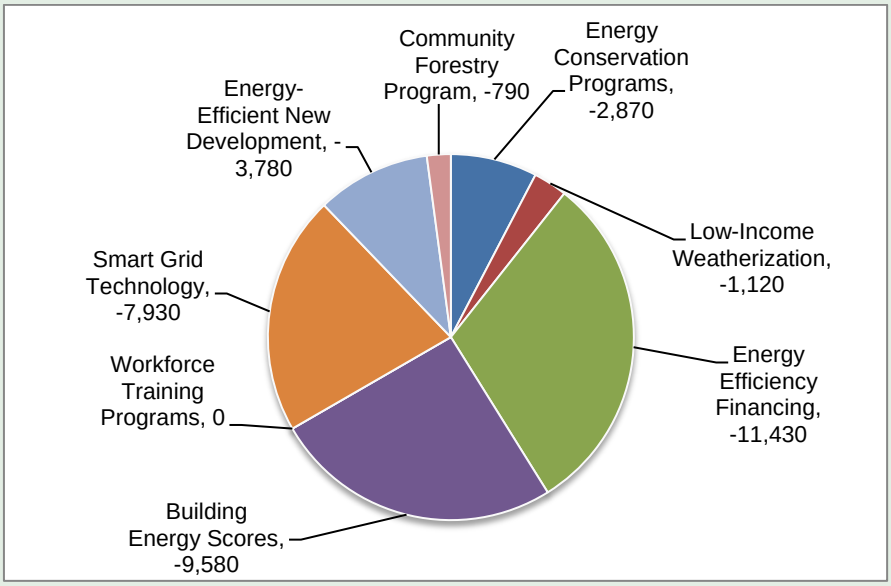
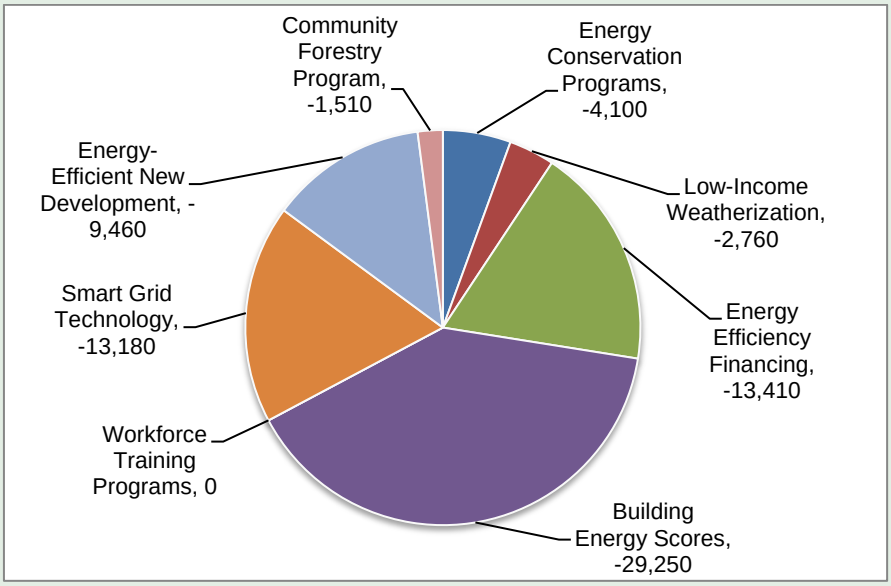



**Figure 5-2.** 2035 Energy Conservation GHG Reduction Measures



### 1. Energy Conservation Programs

Collaborate with local utility providers, educational institutions, and stakeholders to develop effective energy conservation campaigns through energy competitions and to provide targeted marketing for new and existing conservation programs.

**Supporting Actions:**

- Work with local utility providers to develop a competition between the communities within SLO County to reduce total energy consumption over an extended period of time (6 months to 1 year).
- Continue to encourage and promote utility provider energy conservation programs for residential, commercial, industrial, agricultural, and governmental buildings.
- Develop and host a community web portal to streamline access to community and institutional sustainability websites.
- Continue to recognize and encourage conservation programs and educational outreach conducted by industry organizations, non-governmental entities, and government agencies.

**Program Description:**

This measure directs the implementation of a community-wide public outreach and education campaign to inform residents, businesses, and consumers about the ways that individuals can reduce their energy costs and GHG emissions. This includes informing the public about the benefits of using energy-efficient lighting, appliances, and electronics and reminding them of the easiest ways to reduce household and business energy use.

**Relevant COSE Policies:** E 3.4




**Emissions Reductions**

2010:

-860 $MTCO_2e/yr$

2020:

-2, 870 $MTCO_2e/yr$

2035:

-4,100 $MTCO_2e/yr$

Co-Benefits









**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Near-Term |
| Applicability: | Existing development |
| County Costs: | Low-Mid |
| Community Costs: | Low |
| Community Savings: | Medium |
| Performance Indicators: | Number of households and businesses participating |

## 2. Low-Income Weatherization

Promote existing low-income energy conservation and weatherization programs and coordinate with local utility providers and nonprofit corporations to develop additional energy efficiency programs.

**Supporting Actions:**

- Continue to encourage investment in energy efficiency through Community Action Partnership (CAPSLO) and utility provider low-income weatherization programs.
- Support the Community Action Partnership's provision of free energy services to low-income households, including weatherization, furnace repair, and water heater replacement.

**Program Description:**

Several low-income weatherization programs already exist in SLO County and are administered through local utility providers and nonprofit organizations. The existing programs were developed to assist low-income households, recognizing that monetary constraints are significant barriers to purchasing and implementing energy-efficient technologies. This measure quantifies the benefit of those existing programs and advocates for continued funding of such programs in the future.

**Emissions Reductions**

2020:

-1,120 $MTCO_2e/yr$

2035:

-2,760 $MTCO_2e/yr$

**Co-Benefits**







**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | Existing development |
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | Low-Mid |
| Performance Indicators: | Number of households retrofitted |

### 3. Energy Efficiency Financing

Develop and adopt an energy efficiency retrofit program to increase energy efficiency in existing commercial, residential, governmental, and industrial facilities.

**Supporting Actions:**

- Develop an energy efficiency financing program (through PACE, Energy Upgrade California, or other mechanisms) allowing property owners to invest in energy efficiency upgrades for their buildings.

- Encourage and assist voluntary actions including financing programs, by owners of existing commercial and residential buildings for energy efficiency retrofits, such as the installation of solar panels, wind turbines, green roofs, cool roofs, natural lighting, and other long-term, permanent energy conservation installations.

**Program Description:**

In SLO County, the existing building stock is often the largest contributor to energy emissions. This is especially true for buildings built before the 1990s when California's energy efficiency standards were less stringent than modern standards. As these buildings age, they become increasingly reliant on large amounts of energy for heating and cooling due to little or no insulation, window



**Emissions Reductions**

2020:

-11,430 $MTCO_2e/yr$

2035:

-13,410 $MTCO_2e/yr$

**Co-Benefits**










technology, older air conditioning and heating technologies, roofing, and more.

**Relevant COSE Policies:** Goal E 4, E 3.2, E 3.4

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | Existing development |
| County Costs: | Low-Mid |
| Community Costs: | Medium |
| Community Savings: | Medium-High |
| Performance Indicators: | Number of households and businesses participating |

### 4. Energy Efficiency in Existing Buildings

The County will collaborate with the incorporated cities in the county to develop and implement a countywide program to: 1) conduct energy audits or provide EPA Home Energy Scores for residential buildings; 2) disclose energy use history of non-residential buildings; and 3) prepare an energy conservation ordinance to reduce electricity and natural gas use by implementing energy efficiency measures identified in the energy audits.

**Supporting Actions:**

- Seek funding and financing options.
- Explore options for energy audits conducted by the property owner, a certified building inspector, buyer or seller.
- Comply with State Law, AB 1103, to require all non-residential properties to provide buyers or tenants with the previous years' energy use by documenting use through the EPA's Energy Star Portfolio Manager or through some other mechanism.

- Allow in-lieu fees for new development to be utilized for retrofitting existing buildings with energy-efficient fixtures in lieu of energy efficiency measures for new buildings.

- Evaluate options for an energy conservation ordinance. For example, implement energy efficiency measures identified in energy audits:

  - By a date certain for residential and non-residential buildings; and/or
  - For major remodels or additions; and/or
  - For pre-1990 structures or structures in certain climate zones; or
  - At the time of sale.



**Emissions Reductions**

2020:

-9,580 $MTCO_2e/yr$

2035:

-29,250 $MTCO_2e/yr$

Co-Benefits





**Program Description:**

Understanding the current energy use and inefficiencies in a home or commercial building is the first step in identifying cost-effective measures to improve the energy efficiency of a building. By providing new building owners or occupants with a record of current or historic energy use, the new occupants can easily compare the building's energy performance with other similar buildings. Energy use information allows the owner to make renovations keeping in mind options for improving energy efficiency of a building.

**Relevant COSE Policies:** E 3.2.2

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Near-Term |
| Applicability: | Existing development |
| County Costs: | Low |
| Community Costs: | Medium-High |
| Community Savings: | Medium-High |
| Performance Indicators: | Number of residential and nonresidential buildings audited |



**Emissions Reductions**

2020:

Supporting Measure – Not Quantifiable

2035:

Supporting Measure – Not Quantifiable

**Co-Benefits**








### 5. Workforce Training Programs

Continue to seek funding and support green building and weatherization training programs like the SLO County Workforce Investment Board's program funded by the California Clean Energy Workforce Training Program.

**Supporting Actions:**

- Support existing workforce training programs.
- Continue to educate staff and the public about green building through partnerships with local nonprofit organizations (SLO Green Build), professional planning and building organizations (USGBC C4), and local agencies.

**Program Description:**

Workforce training programs like the SLO County Workforce Investment Board's Green Jobs Training Program provide classroom and hands-on training to local unemployed, underemployed, or new workforce entrants. The program covers the basic construction practices of home weatherization retrofits, water efficiency retrofits, and alternative landscaping methods. Providing training to local contractors on efficiency retrofit and installation methods will ensure that property owners investing in such retrofits can achieve their energy or water savings goals.

**Relevant COSE Policies:** E 4.1.1

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | n/a |
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | Number of workforce training participants |

### 6. Smart Grid Technology

Work with local utility providers to implement smart grid technology in new and existing residential and nonresidential properties.

**Supporting Actions:**

- Encourage expedited installation of real-time energy monitoring (such as smart meters) for natural gas, electricity, and water meters on all residential and nonresidential buildings consistent with Board of Supervisors Resolution 2011-62.
- Work with the utility companies to develop a web-based application or install energy monitors to provide customers with real-time feedback on their energy consumption and related costs.
- Encourage building users to install smart grid integrated appliances that can be automated to run when electricity costs are lowest and controlled remotely through a web or phone application.
- Encourage the installation of energy monitors and smart grid appliances in new residential and nonresidential buildings as such appliances become commercially available and economically feasible.

**Program Description:**

The integration of smart grid technology and implementation of dynamic pricing programs will provide energy users with detailed information about their energy use and the costs of energy. Energy customers will be able to use these technologies to track and monitor energy use in real time to understand the relationship between energy consumption patterns and energy costs. Smart grid technology equips individuals to alter behaviors to use less energy and shift higher energy uses to times when the costs are lowest. Research on consumer energy use and the rate of feedback on those patterns has shown that the more frequently consumers are



**Emissions Reductions**

2020:

-7,930 $MTCO_2e/yr$

2035:

-13,180 $MTCO_2e/yr$

**Co-Benefits**







reminded of the level of energy they are using, the more they will change their behaviors to consume less energy. Utility companies have demonstrated that when providing instantaneous energy data in addition to monthly utility bills with total energy consumption and costs, consumers are equipped to more effectively manage energy consumption. PG&E has already begun the process of installing smart meters on customer buildings in San Luis Obispo County, which will be completed by mid-2012. This measure will be consistent with the Board of Supervisor's direction regarding the installation of Smart Meters.

In addition to behavioral changes, the development of new household appliances that can be programmed or timed to operate when energy prices fall below a certain point will also promote energy-saving behaviors. Requirements for new residential and commercial development to include these appliances will further reduce the community's energy use, and such requirements may yield a larger impact when coupled with incentives to encourage current energy users to purchase smart grid appliances when replacing washers, dryers, dishwashers, and other appliances.

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Near-Term |
| Applicability: | New and existing development |
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | High |
| Performance Indicators: | Number of homes and businesses utilizing energy monitoring programs |

### 7. Energy-Efficient New Development

Encourage and incentivize new development projects to exceed minimum Cal Green requirements.

**Supporting Actions:**

- Require the use of energy-efficient equipment in all new development, including but not limited to Energy Star appliances, high-energy efficiency equipment, heat recovery equipment, and building energy management systems.
- Amend community design plans, guidelines, and other documents to promote the following design techniques to maximize solar resources:
  - Passive solar design, thermal mass, and insulation to reduce space heating and cooling needs;
  - Shading on east, west, and south windows with overhangs, awnings, or deciduous trees; and
  - Sustainable site design and landscaping to create comfortable microclimates.
- Encourage new projects to provide ample daylight within the structure through the use of lighting shelves, exterior fins, skylights, atriums, courtyards, or other features to enhance natural light penetration.
- Minimize the use of dark materials on roofs by requiring roofs to achieve a minimum solar reflectivity index (SRI) of 10 for high-slope roofs and 64 for low-slope roofs (CALGreen 5.1 Planning and Design).
- Minimize heat gain from surface parking lots by utilizing the following strategies for a minimum of 50% of the site's hardscape:
  - Provide shade from the existing tree canopy or within five years of landscape installation;



**Emissions Reductions**

2020:

-3,780 $MTCO_2e/yr$

2035:

-9,460 $MTCO_2e/yr$

**Co-Benefits**







  - Provide shade from structures covered by solar panels;
  - Provide shade structures or hardscape materials with a minimum SRI of 29;
  - Use an open-grid pavement system (at least 50% pervious).

- Use light-colored aggregate in new road construction and repaving projects adjacent to existing cities and in some of the communities north of the Cuesta Grade.

**Program Description:**

SLO County has been proactive in supporting voluntary green building practices throughout the community and has been encouraging energy-efficient development in the county through the provision of rebates to projects that exceed Title 24 energy efficiency standards by more than 15%.

As of January 2011, the California Building Standards Commission requires all new buildings to comply with the California Green Building Standards (CALGreen). The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The GHG reductions that will occur through implementation of the mandatory minimum requirements of CALGreen are included in the Business As Usual Forecast. This measure quantifies the GHG benefit of buildings that go beyond the minimum requirements of CALGreen and Title 24 Energy Efficiency Standards.

**Relevant COSE Policies:** E 4.1, E 4.4

**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New development |
| County Costs: | Low-Mid |
| Community Costs: | Medium |
| Community Savings: | Medium |
| Performance Indicators: | Percentage of buildings exceeding CALGreen minimum standards |

### 8. Community Forestry Program

Pursue a comprehensive program to plant and maintain trees on County-maintained roads, medians, and public parking lots in the unincorporated communities. Expand the program to include tree planting on private property where owners wish to be part of the program. Encourage property owners to plant and maintain trees near structures to reduce building energy demand.

**Supporting Actions:**

- Continue tree replacement and mitigation requirements when removing trees with new development.
- Work with County and other government agencies and unincorporated communities to identify public lands suitable for large- and small-scale planting programs.
- Continue to require the protection of native trees on land proposed for development.
- Form partnerships with local advocacy and community groups to fund the planting and maintenance of street trees.
- Partner with government agencies and nongovernmental organizations to provide expertise, maintenance, incentives, and free/low-cost trees to urban and rural property owners and agriculturists.




**Emissions Reductions**

2010:

-240 $MTCO_2e/yr$

2020:

-790 $MTCO_2e/yr$

2035:

-1,510 $MTCO_2e/yr$

**Co-Benefits**



**Strategic Growth Principle**

Maintain and protect a living environment that is safe, healthful, and pleasant for all residents.

- Participate in community greening projects in five unincorporated communities through grants and community plans.
- Establish a website to disseminate tree planting information, solicit donations, and educate the public regarding the multiple benefits of tree planting programs.

**Program Description:**

The energy and greenhouse gas benefits of this measure result from increased shading on buildings and pavements and carbon sequestered by new trees. Increased shading causes lower urban temperatures, thus reducing the urban "heat island" effect. Each tree planted absorbs carbon in the atmosphere.

**Relevant COSE Policies:** BR 3.2

**Implementation:**

| **Responsible Department:** | **Planning and Building, Public Works** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | New development |
| County Costs: | Low |
| Community Costs: | Low-Mid |
| Community Savings: | Low-Mid |
| Performance Indicators: | Number of new trees planted |

## RENEWABLE ENERGY

**GOAL: INCREASE THE PRODUCTION OF RENEWABLE ENERGY FROM SMALL-SCALE AND COMMERCIAL-SCALE RENEWABLE ENERGY INSTALLATIONS TO ACCOUNT FOR 10% OF TOTAL LOCAL ENERGY USE BY 2020.**

While energy efficiency in the built environment is the first step to reducing energy consumption and GHG emissions, only so much energy consumption can be eliminated. A minimum level of energy is necessary to support a functioning built environment. The intent of this goal is to shift energy consumption that cannot be reduced through energy efficiency away from traditional electricity and natural gas to renewable energy sources.

Both natural gas and electricity can be offset with renewable sources of energy that are profitable, yield cost savings to users, and spur local energy independence. Through this goal, the County will reduce greenhouse gas emissions from traditional electricity production and natural gas by promoting the production of on-site renewable energy for both residential and nonresidential uses.

The Conservation and Open Space Element includes the goal to produce enough renewable energy to account for 10% of total local energy use by 2020. To achieve this goal, the County will rely on small-scale or distributed renewable energy sources as well as the development of larger commercial facilities, like those proposed in the eastern portion of the county. Distributed renewable energy systems will be installed through the development of a financing program and continued partnerships with local and state government agencies to install renewable energy systems on appropriate facilities. In 2007, the State of California began the California Solar Initiative (CSI), providing rebates and incentives to residents and businesses installing photovoltaic and solar thermal renewable energy systems on their properties. Between 2007 and 2010, over 180 systems were installed on buildings in the unincorporated areas of the county to produce more than 3.5 million kWh annually. The GHG reduction benefit from the CSI is included in the state policy reductions identified in Chapter 4.




**How much power is 10 megawatts?**

Approximately the energy used in 2,000 single-family homes each year

**What is distributed renewable energy?**

- Less than 10 MW
- Serves the facility it is attached to
- Feeds surplus energy back into the grid for other local use



SLO-RESCO (Renewable Energy Secure Community) group is inventorying the renewable energy resource opportunities in San Luis Obispo County and is investigating pathways to develop those renewable resources.

The development of additional large-scale renewable energy facilities within the county will also be pursued. However, the energy produced by these facilities will be purchased by the state's investor-owned electric utility companies to help achieve their renewable portfolio standard requirements; therefore, the GHG emissions reduction benefit of these facilities is already incorporated into the state policy measure identified in Chapter 4. Table 5-2 provides a summary of GHG emissions reductions from the renewable energy goal and measures.

## **Table 5-2.** Renewable Energy GHG Emissions Reduction Summary

| # | Measure | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|---|
| 9. | Countywide Energy Collaborative | 0 | 0 to -20,680 | 0 to -36,530 |
| 10. | Commercial-Scale Renewable Energy | Included in the Renewable Portfolio Standard | Included in the Renewable Portfolio Standard | Included in the Renewable Portfolio Standard |
| 11. | Small-Scale Renewable Energy | n/a | -19,850 | -20,130 |
| 12. | Renewable Energy Partnerships | -450 | -760 | -1,260 |
| **Total** | | **-450** | **-20,610 to -41,290** | **-21,390 to -57,920** |

Figure 5-3 and Figure 5-4 illustrate how each reduction measure contributes to the overall goal of reducing emissions by installing renewable energy systems by 2020 and 2035.



**Figure 5-3.** 2020 Renewable Energy GHG Emissions Reductions

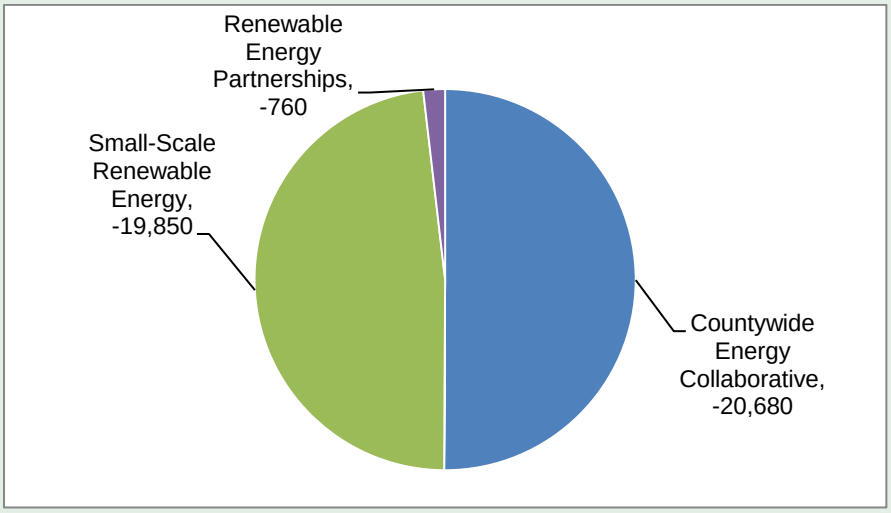
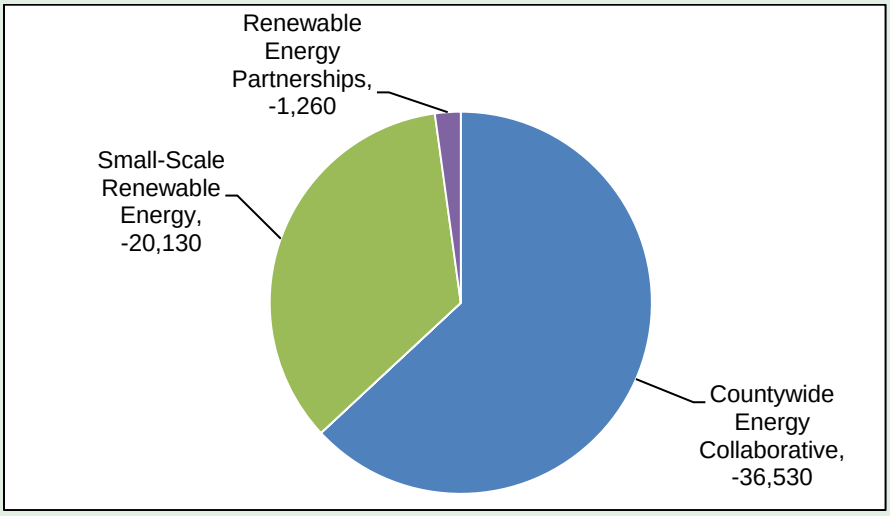



**Figure 5-4.** 2035 Renewable Energy GHG Emissions Reductions





**Emissions Reductions**

2020:

0 to -20,680

2035:

0 to -36,530

**Co-Benefits**




### 9. Countywide Energy Collaborative

Build a collaborative network or organizational structure to work with the seven cities, other local and state agencies, investor-owned utilities, the California Energy Commission, and the California Public Utilities Commission to promote a wide range of energy efficiency and renewable programs.

**Supporting Actions:**

- Increase County participation and Energy Watch funding to localize existing programs such as commercial and residential direct install.
- Form a regional energy authority or other organizational structure that will include cities, the County, and state and local agencies.
- Evaluate a local "feed in tariff" for renewable energy distributed generation.
- Work with the utilities to establish other local energy-related programs such as public agency energy efficiency programs.
- Evaluate the development of a Community Choice Aggregation program with the incorporated cities in San Luis Obispo County to procure up to 50% of the region's electricity use from renewable resources by 2020.
- Establish a countywide energy office that will serve as a centralized location for energy efficiency and generation, energy financing, water conservation, green building and other sustainability programs.

**Program Description:**

The Countywide office will be dedicated to promoting sustainable energy programs and practices throughout the county. It will work with the incorporated cities to evaluate options for securing



electricity from renewable resources beyond the State's Renewable Portfolio Requirements.

**Relevant COSE Policies:** E 1.2

**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | Other |
| County Costs: | High |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | 50% of electricity from renewable sources by 2020 and 75% by 2035 |

### 10. Commercial-Scale Renewable Energy

Develop a comprehensive renewable energy strategy to encourage the commercial-scale installation of renewable energy projects within the county.

**Supporting Actions:**

- Complete the Renewable Energy Secure Community (RESCO) contract project by 2012.
- Use state, federal, or other available data to map areas that contain renewable energy resources by 2015.
- Designate and protect areas that contain renewable energy resources such as wind, solar, geothermal, and small hydroelectric.
- Continue participation in the Energy Watch Partnership.
- Amend the Land Use Ordinance to apply renewable energy overlay designations to areas identified in COSE Implementation Strategy E 6.8.1.

**Emissions Reductions**

2020:

Included in the State's Renewable Portfolio Standard

2035:

Included in the State's Renewable Portfolio Standard

**Co-Benefits**





**Program Description:**

The development of large-scale renewable energy projects within San Luis Obispo County will be pursued by California's investor-owned utilities as they seek to achieve the State's renewable portfolio standard requirements. This measure aims to identify and protect the potential renewable energy resources available in the county and to remove any unnecessary barriers to the development of renewable energy projects.

**Relevant COSE Policies:** E 1.2, E 6.8

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | Other |
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | Megawatts of solar installed |

**Emissions Reductions**

2020:

-19,850 $MTCO_2e/yr$

2035:

-20,130 $MTCO_2e/yr$

**Co-Benefits**






## 11. Small-Scale Renewable Energy

Implement a financing program to provide property owners with low-interest loans for the installation of renewable energy resources (refer to Measure 3).

**Supporting Actions:**

- Revise County policies and regulations as needed to eliminate barriers to or unreasonable restrictions on the use of renewable energy.
- Designate and protect areas that contain potential small-scale renewable energy resources such as wind, solar, geothermal, and small hydroelectric.
- Amend the Land Use Ordinance to apply small-scale renewable energy overlay designations to areas identified in



the RESCO study. Also see COSE Implementation Strategy E 6.8.1 for commercial scale.

- Promote the development of sustainable energy sources and renewable energy projects through streamlined planning and development rules, codes, processing, and other incentives.
- Collaborate with stakeholder groups, including business and property owners, wineries, and other agricultural operations, to increase awareness of renewable energy systems, to streamline the permitting process, and to identify incentives.
- Assign a single point of contact within the County Planning and Building Department for energy efficiency and renewable energy project questions.

**Program Description:**

The goal of this measure is to reduce GHG emissions from residential and commercial energy use by facilitating the development of small-scale distributed renewable energy production. This will be accomplished through (1) adoption of incentives, such as permit streamlining and fee waivers, as feasible; (2) amendments to development codes, design guidelines, and zoning ordinances, as necessary; and (3) creation of a financing program to remove the up-front cost barriers to property owners interested in installing distributed renewable energy systems.



**Relevant COSE Policies:** E 1.2, E 3.1, E 6.1, E 6.6

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New and existing development |
| County Costs: | Low |
| Community Costs: | High |
| Community Savings: | High |
| Performance Indicators: | Megawatts of renewable energy installed |



The County can partner with other state and local agencies to implement renewable energy projects at these facilities.

**Emissions Reductions**

2010:

-450 $MTCO_2e/yr$

2020:

-760 $MTCO_2e/yr$

2035:

-1,260 $MTCO_2e/yr$

**Co-Benefits**



## 12. Renewable Energy Partnerships

Collaborate with local and state governmental agencies (California Men's Colony, Cal Poly, Cuesta College, etc.) and energy facility operators to develop renewable energy sources at existing facilities.

**Supporting Actions:**

- Work with PG&E, Cal Poly, and other organizations or businesses as appropriate to sponsor demonstration projects for community solar photovoltaic power, wind energy, and light-emitting diode (LED) lights for roads and parking lots.
- Seek funding and low-interest loan opportunities for local and state agencies to purchase and install renewable energy systems, with a goal of achieving 10% of total local and state agency energy use from on-site renewable energy installations by 2020.

**Program Description:**

This measure aims to support local government and state facilities located in the unincorporated county in their efforts to implement sustainable practices. When these agencies and facilities incorporate sustainability into their operations, they not only lead by example but often save taxpayer money by reducing their energy or water costs.

**Relevant COSE Policies:** E 6.4

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | Government facilities |
| County Costs: | n/a |
| Community Costs: | n/a |
| Community Savings: | n/a |
| Performance Indicators: | Megawatts of renewable energy installed |

## SOLID WASTE

**GOAL: REDUCE METHANE EMISSIONS FROM DISPOSED WASTE BY ACHIEVING AS CLOSE TO ZERO WASTE AS POSSIBLE THROUGH INCREASED DIVERSION RATES, METHANE CAPTURE AND RECOVERY, AND OTHER STRATEGIES.**



Both the consumption and disposal of resources require energy and emit greenhouse gases. As waste is sent to the landfill, it decomposes and emits methane gas. By providing additional opportunities to recycle and compost, waste disposal trends within the community can be reduced, thereby reducing GHG emissions associated with waste disposal. Additionally, the impact of transporting waste from homes and businesses by waste fleet vehicles can be reduced through increased diversion and cleaner vehicle fleets.

There are three primary options to reducing waste that is sent to the landfill:

Reduce, Reuse, or Recycle.

This goal includes the expansion of curbside recycling opportunities, expansion of curbside green waste to all communities, the expansion of curbside collection of food waste, expanded requirements for construction and demolition waste diversion, and an increase in the amount of methane captured at landfills in the county. These measures will be implemented in partnership with the SLO County Integrated Waste Management Authority and are anticipated to reduce emissions from waste decomposition by 23,880 $MTCO_2e$ by 2020.

Table 5-3 presents a summary of GHG emissions reductions from the solid waste goal and reduction measures. Figure 5-5 and Figure 5-6 illustrate how each reduction measure contributes to the overall solids waste goal of reducing emissions by 2020 and 2035.

As waste decomposes, landfills release methane, a greenhouse gas 21 times as strong as carbon dioxide at trapping heat in our atmosphere.

### **Table 5-3.** Solid Waste GHG Emissions Reduction Summary

| # | Measure | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|
| 13. | Recycling | -6,170 | -7,170 |
| 14. | Composting & Green Waste | -3,230 | -4,560 |



| # | Measure | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|
| 15. | Construction & Demolition Waste | -1,360 | -2,220 |
| 16. | Waste Hauling Fleet | n/a | n/a |
| 17. | Landfill Methane Capture | -13,120 | -17,800 |
| | **Total** | **-23,880** | **-31,750** |

**Figure 5-5.** 2020 Solid Waste GHG Emissions Reductions

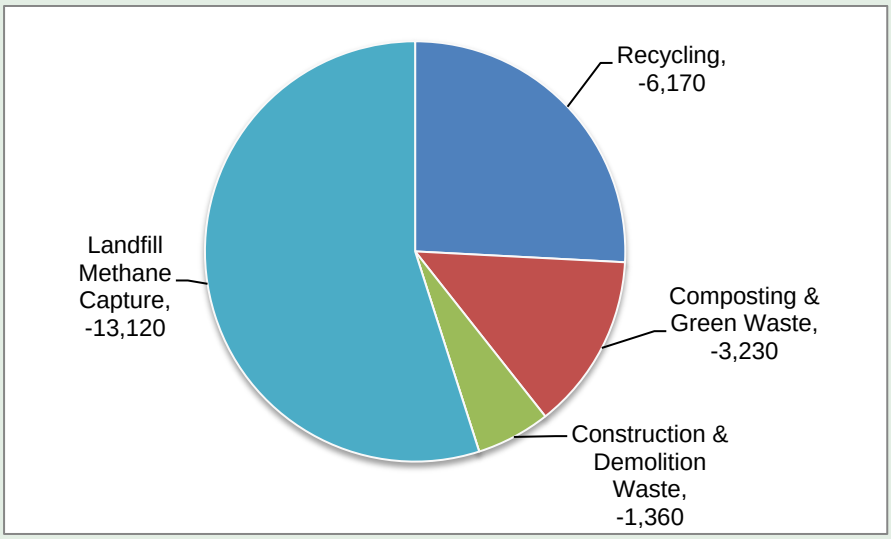
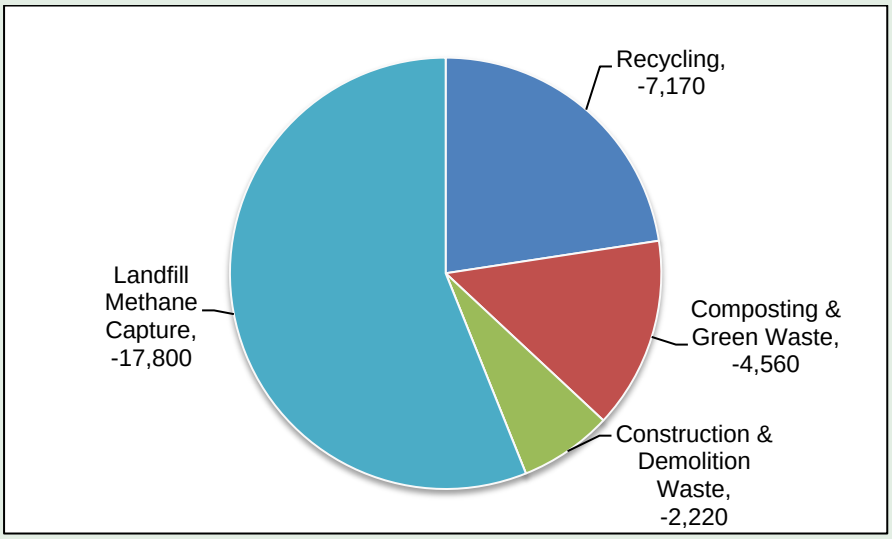



**Figure 5-6.** 2035 Solid Waste GHG Emissions Reductions



### 13. Recycling

Provide additional opportunities for county residents to recycle cardboard, glass, paper, and plastic products.

**Supporting Actions:**

- Incorporate new standards for trash collection enclosures in County ordinances. At a minimum, enclosures should accommodate two 4-yard containers.
- Support, promote, and recognize ongoing efforts of the business community, schools, universities, and nonprofit organizations to develop additional products and uses that expand the range of materials that can be recycled.
- Nominate businesses and institutions for recognition through CalRecycle's Waste Reduction Awards Program (WRAP).
- Maximize collection and participation in curbside recycling through weekly collection of recyclables in all areas with recycling service.




**Emissions Reductions**

2020:

-6,170 $MTCO_2e/yr$

2035:

-7,170 $MTCO_2e/yr$

**Program Description:**

This measure supports the efforts of the SLO County Integrated Waste Management Authority (IWMA) to ensure that all residents and businesses will have the opportunity to recycle cardboard, glass, paper, and plastic products at little or no cost. Recycling these products instead of disposing them in the landfill reduces methane emissions associated with the decomposition of these materials.

**Relevant COSE Policies:** E 5.1

**Implementation:**

| **Responsible Department:** | **Public Works, Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New and existing development |



| | |
|---|---|
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | Percentage of residents and businesses with access to recycling opportunities |

### 14. Composting & Green Waste

Implement a composting and green waste program in those communities without them.

**Emissions Reductions**

2020:

-3,230 $MTCO_2e/yr$

2035:

-4,560 $MTCO_2e/yr$

**Supporting Actions:**

- Encourage the development of biomass, green waste, and food waste composting facilities (agricultural, residential, food service, commercial, industrial sources) for the proper management of organics in locations where land use conflicts can be minimized.
- Work with IWMA, Cal Poly, the school districts, and other state and local agencies to develop a Countywide Food Waste Composting Program for businesses, schools, and residents.
- Implement a curbside green waste and food waste pickup in combination with existing green waste pickup, where feasible.
- In locations where curbside green waste and food waste pickup is not feasible, encourage residents to install home composting equipment.
- Partner with IWMA to develop a public education campaign for residents and businesses about composting and green waste opportunities.
- Amend the County's Land Use and Coastal Zone Land Use Ordinances (22.30.610) to require events that require a discretionary land use permit, to strive to achieve zero



waste (or as close as possible) by recycling and composting the waste from each event.

**Program Description:**

Food and plant waste currently makes up almost 22% of the waste disposed at landfills. By implementing programs to collect and compost this waste instead of disposing it into a landfill, the County will be able to reduce GHG emissions associated with food and plant waste.

**Relevant COSE Policies:** E 5.1, E 5.3

**Implementation:**

| **Responsible Department:** | **Public Works** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New and existing development |
| County Costs: | Minimal |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | Percentage of residents and businesses with access to food waste and green waste opportunities |

### 15. Construction & Demolition Waste

Reduce construction and demolition waste by requiring a minimum of 75% nonhazardous construction and demolition debris generated on site to be recycled or salvaged.

**Supporting Actions:**

- Update the Construction and Demolition Debris Recycling Ordinance to require increased C&D diversion rates that are phased in over the next 10 years.
- Promote the continued use and development of material re-use facilities and programs like Habitat for Humanity's



**Emissions Reductions**

2020:

-1,360 $MTCO_2e/yr$

2035:

-2,220 $MTCO_2e/yr$

**Co-Benefits**



ReStore and other private enterprises. Encourage the reuse of salvaged architecturally significant materials.

- Work with the construction community to identify additional recycling opportunities needed to reach C&D diversion rates (e.g., painted lumber, Styrofoam packaging).
- Encourage the use of post-consumer recycled content and/or certified sustainable production in building materials.
- Encourage building design and materials production that minimize waste.

**Program Description:**

The current construction and demolition waste ordinance requires all projects with a construction or demolition permit to demonstrate that 50% of the materials removed from the site (exclusive of hazardous materials) are recycled or reused. Increasing the amount of waste to be recycled or reused to 75% for residential and 80% for nonresidential projects will keep over 5,900 additional tons of construction-related waste out of local landfills.

**Relevant COSE Policies:** CR 3.3, E 5.4

**Implementation:**

| **Responsible Department:** | **Public Works** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New development |
| County Costs: | Low |
| Community Costs: | Low |
| Community Savings: | Low |
| Performance Indicators: | Construction and demolition waste diversion rate |

### 16. Waste Hauling Fleet

Encourage waste haulers on contract with the County to use clean, alternative fuels for waste collection vehicles.

**Supporting Actions:**

- Encourage the installation of alternative fueling stations and sites that are available for use by public and private vehicles, including waste fleets.
- Support the Air Pollution Control District and other agencies in securing funding (through grants or other mechanisms) to continue to convert waste hauling fleets to cleaner, more efficient fuels like biodiesel or compressed natural gas.

**Program Description:**

By providing additional alternative fueling stations, utilizing alternative fuels will become a more viable option for waste hauling fleets. For example, the Cold Canyon Landfill recently installed a compressed natural gas (CNG) fueling station for use by Waste Management's expanding CNG fleet. As of January 2011, Waste Connections, Inc. had replaced 11 of their waste fleet trucks with new vehicles to run on CNG, with assistance from the SLO County Air Pollution Control District.

**Relevant COSE Policies:** AQ 2.4

**Implementation:**

| **Responsible Department:** | **Public Works, Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | Other |
| County Costs: | Minimal |
| Community Costs: | n/a |
| Community Savings: | n/a |
| Performance Indicators: | Number of waste fleet vehicles using alternative fuels |



**Emissions Reductions**

2020:

Supporting Measure - Not Quantified

2035:

Supporting Measure - Not Quantified

**Co-Benefits**



**Emissions Reductions**

2020:

-13,120 $MTCO_2e/yr$

2035:

-17,800 $MTCO_2e/yr$

### 17. Landfill Methane Capture

Increase methane capture rates at all operating landfills in the county.

**Supporting Actions:**

- Ensure landfills continue to apply best management practices for landfill design, operations, and closure/post-closure practices in compliance with state regulations.
- Increase recovery of landfill gas for use as a biomass renewable energy source to replace energy from nonrenewable fossil fuel sources.
- Assist landfills in developing best management practices and new technologies for reducing GHG emissions from active landfills.

**Program Description:**

As waste decomposes within a landfill, methane gas is released. While local landfills all have methane capture mechanisms in place to capture a portion of the gas, there is opportunity to implement additional measures at each landfill to capture additional methane gas and utilize that gas to produce energy.

**Relevant COSE Policies:** E 1.4

**Implementation:**

| **Responsible Department:** | **Public Works** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | Landfills |
| County Costs: | Low |
| Community Costs: | n/a |
| Community Savings: | n/a |
| Performance Indicators: | Methane capture rate at each landfill |

## LAND USE & TRANSPORTATION

### GOAL: REDUCE TRANSPORTATION EMISSIONS THROUGH IMPROVEMENTS IN VEHICLE FUEL EFFICIENCY, EXPANSION OF NON-AUTO MODES OF TRAVEL, AND IMPLEMENTATION OF STRATEGIC GROWTH LAND USE POLICIES.




The distribution of land uses throughout the county shapes community transportation choices. In order to take part in the tasks of daily living, each day people must make choices about transportation that have a direct impact on GHG emissions.

Transportation is the largest contributor of GHGs within the county and one of the most complex sectors to address. Economic considerations, political boundaries, and other factors can complicate actions to optimize land use and transportation options. Expansion of mode choices within and between communities and expanded diversity of land uses can replace single-driver trips with low- or zero-emissions modes like walking, biking, transit, and carpooling.

In addition to the expansion of transportation alternatives, GHG emissions reductions will rely on increases in vehicle fuel efficiency and expansion of alternative fuel uses through California's Clean Car Standards (AB 1493) and the Low Carbon Fuel Standard.

Reducing emissions from transportation will require a multifaceted approach that includes an improved mixture of land uses; improved connectivity and circulation in existing neighborhoods; expansion of bicycle, pedestrian, and transit networks; parking reduction strategies; provision of affordable housing; and expansion of alternative fuel uses. It is important to note that these strategies may be interdependent and that when combined, the GHG emissions reductions may reach 43,470 $MTCO_2e$ annually by 2020.

Table 5-4 provides a summary of the contribution that each strategy will have on reducing transportation-related GHG emissions. Figure 5-7 and Figure 5-8 illustrate the contribution of each measure

**Transportation-related emissions can be reduced in one of three ways:**

- Improving vehicle fuel efficiency
- Replacing vehicle trips with alternative modes such as biking, carpooling, or transit
- Reducing the miles traveled by vehicle through implementation of Strategic Growth Principles.



category to the overall land use and transportation reductions for 2020 and 2035.

## Table 5-4. Land Use and Transportation GHG Emissions Reduction Summary

| # | Measure | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|
| 18. | Strategic Growth | n/a | n/a |
| 19. | Transit Accessibility | n/a | n/a |
| 20. | Affordable Housing | -2,390 to -4,000 | -2,850 to -6,670 |
| 21. | Bicycle & Pedestrian Network | -1,600 to -8,050 | -1,910 to -9,510 |
| 22. | Parking Supply Limits | -2,010 to -19,670 | -2,360 to -23,250 |
| 23. | Unbundle Parking Costs | -170 to -4,030 | -180 to -4,7540 |
| 24. | Commute Trip Reduction Programs | -1,700 to -3,850 | -2,010 to -4,510 |
| 25. | Alternative Fuels | -5,280 | -11,170 |
| | **Total** | **-11,740 to -43,470[1]** | **-16,890 to -56,280[1]** |

1. Due to rounding of decimals, the sum of all values may not equal the total.

## Figure 5-7. 2020 Land Use and Transportation GHG Emissions Reductions

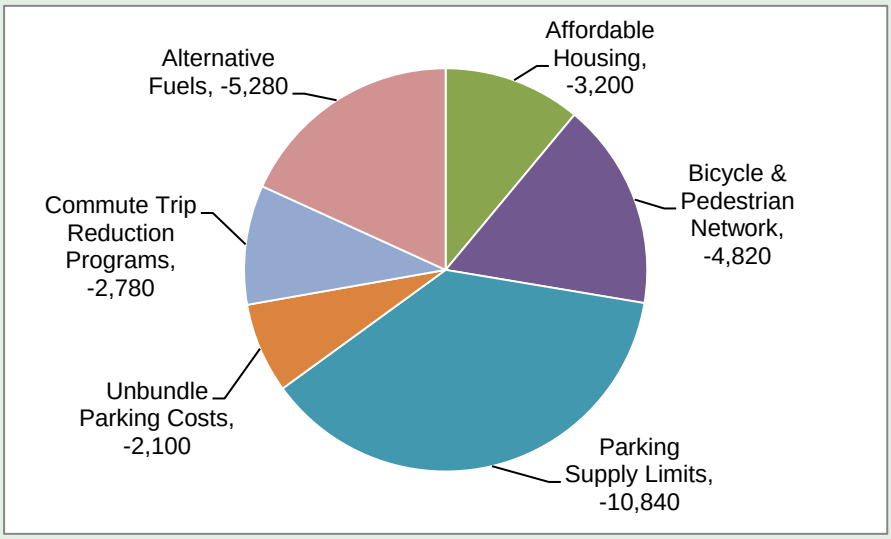


**Figure 5-8.** 2035 Land Use and Transportation GHG Emissions Reductions

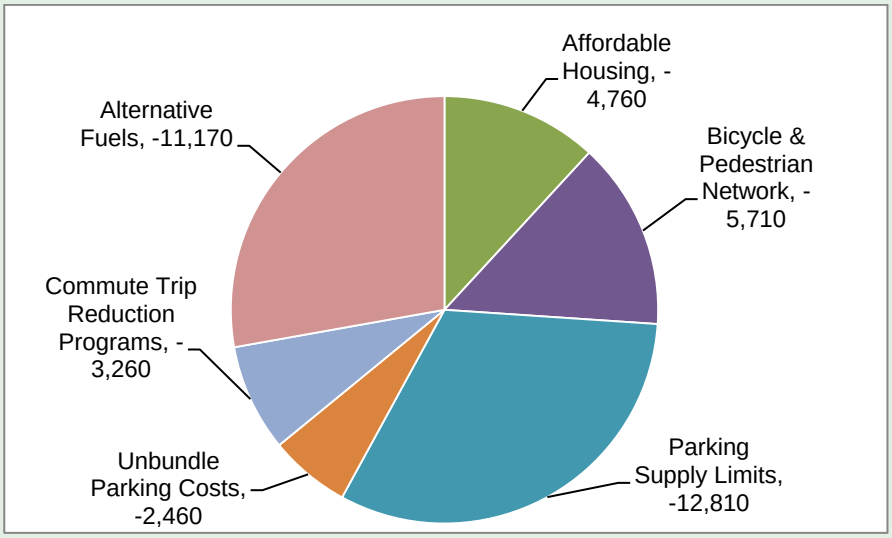








**Table 5-5.** San Luis Obispo County's Strategic Growth Principles

| | Land Use and Transportation Strategies | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Strategic Growth Principles** | **Strategic Growth** | **Transit Accessibility** | **Affordable Housing** | **Bicycle & Pedestrian Network** | **Parking Supply Limits** | **Unbundle Parking Costs** | **Commute Trip Reduction Programs** | **Alternative Fuels** |
| Strengthen Regional Cooperation | X | X | X | X | | | X | X |
| Preserve Open Space, Natural Beauty & Natural Resources. Conserve Energy. Protect Agricultural land and Resources. | X | | | X | X | | | X |
| Strengthen & Direct Development Toward Existing and Strategically Planned Communities. | X | | | | X | X | | |
| Foster Distinctive, Attractive Communities with a Strong Sense of Place. | X | | | X | | | | |
| Provide a Variety of Transportation Choices. | | X | X | X | | | X | X |
| Create a Range of Housing Opportunities and Choices. | X | X | X | | | X | | |
| Encourage Mixed Land uses. | X | | X | | X | | | |
| Create Walkable Neighborhoods & Towns. | X | X | | X | X | | X | |
| Take Advantage of Compact Building Design. | X | | X | | X | | | |
| Make Development Decisions Predictable, Fair & Cost-Effective. | X | | | X | X | X | | |
| Encourage Community & Stakeholder Collaboration. | | X | X | X | | | X | X |

### 18. Strategic Growth

Continue to implement strategic growth strategies that direct the county's future growth into existing communities and to provide complete services to meet local needs.

**Supporting Actions:**

- Integrate higher-density development within existing communities using vacant or underutilized infill parcels and lands adjacent to existing development.
- Establish minimum residential densities in the residential multi-family (RMF) land use category where resources are available.
- Integrate complete streets policies and projects into updates of the Land Use and Circulation Element updates, Area Plans, and Community Plans.
- Amend applicable ordinances to facilitate pedestrian circulation within and between commercial and mixed-use sites and nearby residential areas.
- Update the countywide design guidelines to create maximum connectivity between neighborhoods, streets, and projects for pedestrian and bicycle travel.
- Promote the use of ground-floor or street-oriented space in commercial and mixed-use centers for retail, food service, financial institutions, and other high-volume commercial uses.
- Encourage new residential development to be within walking distance (1/2 mile or less) of public activity centers such as schools, libraries, parks, and community centers.
- Provide incentives for mixed-use development and land banking strategies that encourage strategic growth and infill development.



**Emissions Reductions**

2020:

Included in BAU Forecast

2035:

Included in BAU Forecast

**Co-Benefits**





- Retrofit existing, older neighborhoods to improve connectivity, redesign circulation, and create walkable streets.

**Program Description:**

Increased density, improved design, land use diversity, and improved access to destinations play a critical role in reducing the distance traveled in vehicles and expands opportunities to utilize non-auto modes of transportation. Density, design, diversity, and destination accessibility, known as the 4-Ds, are measurements of the urban and built environment, which indicate the distance people travel and the mode used to travel.

**Relevant COSE Policies:** AQ 1.1, AQ 1.2

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | New development |
| County Costs: | Medium-High |
| Community Costs: | n/a |
| Community Savings: | n/a |
| Performance Indicators: | n/a |

### 19. Transit Accessibility

Work with the San Luis Obispo Regional Transit Authority, San Luis Obispo Council of Governments, local cities, transit providers, and other agencies to identify transit nodes appropriate for mixed-use development and promote transit-oriented development where appropriate.

**Supporting Actions:**

- Amend applicable ordinances and policies to direct most new residential development away from rural areas and to concentrate new residential development in higher-density

residential areas located near major transportation corridors and transit routes, where resources and services are available.

- Add transit routes that provide intercity express services to provide efficient alternatives to auto trips.
- Allocate adequate funding for long-term transit operations to ensure higher-density residential developments have access to transit opportunities.

**Program Description:**

This measure will direct the County to identify transit nodes in conjunction with local transit providers and the San Luis Obispo Council of Governments (SLOCOG) and will rely on the density, diversity, and accessibility improvements from the strategic growth measure.

**Relevant COSE Policies:** AQ 1.5, AQ 1.6

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | New and existing development |
| County Costs: | Low-Mid |
| Community Costs: | n/a |
| Community Savings: | n/a |
| Performance Indicators: | Percentage of residents within a ½ mile of a transit stop |




**Emissions Reductions**

2020:

Included in BAU Forecast

2035:

Included in BAU Forecast

**Co-Benefits**





## 20. Affordable Housing

Continue to increase the amount of affordable housing provided in San Luis Obispo County. Affordable and below-market-rate housing provides greater opportunity for lower-income families to live closer to job and activity centers, providing residents with greater access to transit and alternative modes.



**Emissions Reductions**

2020:

-2,390 to -4,000 $MTCO_2e/yr$

2035:

-2,850 to -6,670 $MTCO_2e/yr$

**Co-Benefits**





**Supporting Actions:**

- Provide programs, incentives, and regulations for affordable mixed-use housing.
- Encourage mixed-use development through affordable housing programs and regulations.

**Program Description:**

Income has a statistically significant effect on the probability that a person will take transit or walk to destinations. By developing affordable and below-market-rate housing, greater opportunities are afforded to lower-income families to live closer to job centers and provide a greater balance of jobs and housing within the unincorporated communities.

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | New development |
| County Costs: | Medium |
| Community Costs: | Medium |
| Community Savings: | Medium-High |
| Performance Indicators: | Number of affordable housing units developed |

## 21. Bicycle & Pedestrian Network

Improve access to community-wide pedestrian and bicycle networks by removing barriers and providing additional bike- and pedestrian-oriented infrastructure.

**Supporting Actions:**

- Amend applicable ordinances to direct new development to construct paths that connect land uses and other non-

motorized routes and safe road crossings at major intersections.

- Amend applicable ordinances to direct new development to provide secure, weatherproof bicycle parking and storage facilities and ensure the long-term maintenance of such facilities.
- Identify abandoned rail rights-of-way not planned for transit or freight use, analyze the feasibility of their use for non-motorized transportation, and incorporate them into the County's Parks and Recreation Element, the Bikeways Plan, and the Non-Motorized Transportation Program of the Regional Transportation Plan as appropriate.
- Support SLOCOG and local cities in the implementation of bicycle and pedestrian master plans to facilitate non-auto travel within and between communities.
- Incorporate complete streets policies into the Circulation Element and implement complete streets policies on all future County roadway projects.
- Support the expansion of Safe Routes to School Programs to all elementary and middle schools within the county and assess potential roadway improvements for increased safety within school zones.
- Implement, monitor, and update the County Bikeways Plan.
- Support SLO Regional Rideshare and SLO County Bicycle Coalition activities and programs that promote the increased use of bicycles for transportation and recreation.

**Program Description:**

Providing a safe and accessible network of bicycle and pedestrian facilities will offer greater opportunities for people to walk or bike between destinations instead of driving. A complete network of facilities will include sidewalks, bike lanes, paths, and routes, as




**Emissions Reductions**

2020:

-1,600 to -8,050 $MTCO_2e/yr$

2035:

-1,910 to -9,510 $MTCO_2e/yr$

**Co-Benefits**






well as support facilities like secure bike parking, changing facilities, enhanced intersection crossings, and traffic calming improvements.

**Relevant COSE Policies:** AQ 1.3, AQ 1.4, AQ 1.7

**Implementation:**

| **Responsible Department:** | **Planning and Building, Public Works** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | New and existing development |
| County Costs: | High |
| Community Costs: | Low-Mid |
| Community Savings: | High |
| Performance Indicators: | Miles of bike lanes and sidewalks |

### 22. Parking Supply Limits

**Emissions Reductions**

2020:

-2,010 to -19,670 $MTCO_2e/yr$

2035:

-2,360 to -23,250 $MTCO_2e/yr$

Revise County parking requirements to ensure development meets the County's strategic growth objectives while providing alternative transportation choices to project residents and employees and efficient design options, as well as flexibility to project applicants. Specifically, consistent with the General Plan, reduce parking requirements in areas where a variety of uses and services are planned in close proximity to each other and to transit.

**Supporting Actions:**

- Reduce minimum parking requirements in areas such as central business districts.
- Work with developers to utilize in-lieu parking fees to develop concentrated parking where needed.
- Amend applicable ordinances and codes to provide parking options and flexibility for mixed-use development.
- Allow more affordable units without parking for project residents who do not wish to pay for it.



- Revise parking requirements for public and new commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.

**Program Description:**

Parking requirements will be changed to encourage and facilitate strategic growth development and alternative transportation choices by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking for non-conflicting uses.

**Relevant COSE Policies**: AQ 1.2

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New development |
| County Costs: | Low-Mid |
| Community Costs: | Low-Mid |
| Community Savings: | High |
| Performance Indicators: | Average shared parking reductions |

### 23. Unbundle Parking Costs

Parking and property costs will be separated to enable those who choose to utilize a parking space to do so at an additional cost separate from the cost of the property.



**Emissions Reductions**

2020:

-170 to -4,030 $MTCO_2e/yr$

2035:

-180 to -4,750 $MTCO_2e/yr$

**Co-Benefits**



**Supporting Actions:**

- Amend applicable land use ordinances and policies to separate parking costs from development costs in appropriate places and sites.
- Modify the land use ordinance to allow more affordable units without parking for residents who do not wish to pay for it.

**Program Description:**

Unbundling separates parking costs from the property costs, enabling those who wish to purchase parking spaces to do so at an additional cost from the property cost. This separation removes the burden from those who do not wish to utilize a parking space and passes the actual cost of providing parking spaces to those who use them.

**Relevant COSE Policies**: AQ 1.2

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New development |
| County Costs: | Low-Mid |
| Community Costs: | Low-Mid |
| Community Savings: | High |
| Performance Indicators: | none |

### 24. Commute Trip Reduction Programs

Continue to support voluntary commute trip reduction programs.

**Supporting Actions:**

- Support regional work centers and identify appropriate locations for shared-use, regional work centers for public and private use.

- Require new residential multi-family projects subject to discretionary review to create a transportation demand management (TDM) plan, which may include:
  - Reduced parking for affordable, workforce, or senior housing
  - Subsidized public transportation passes
  - Car sharing, vanpools, shuttles, or ride-matching programs
- Require new or expanded commercial, industrial, public, or mixed-use projects with 25 employees or more to create a TDM plan, which may include:
  - Parking cash-out,
  - Subsidized public transportation passes,
  - Car sharing, vanpools, shuttles, or ride-matching programs,
  - Bicycle parking and storage facilities, and
  - Alternative work schedules, when applicable.
- Consider revisions to required traffic mitigation fees where vehicle trip reduction programs will be effectively implemented over the long term.
- Require new or expanded mixed-use, industrial, commercial, office, or residential development (with a minimum of 15 units per acre and/or 25 employees) to provide transit passes valid for at least one year to each resident or employee for the first year of project occupancy.
- Continue to support SLO Regional Rideshare and the SLO County Air Pollution Control District's programs and events.

**Program Description:**

Trips associated with commuting will be reduced through a multi-strategy approach encompassing transit fare subsidies, rideshare programs, parking permit programs, alternative work schedules, and other commute-related strategies. San Luis Obispo Regional Rideshare and the Air Pollution Control District already provide



**Emissions Reductions**

2020:

-1,700 to -3,850 $MTCO_2e/yr$

2035:

-2,010 to -4,510 $MTCO_2e/yr$

**Co-Benefits**







programs to encourage and incentivize employees' and businesses' trip reductions throughout the county.

**Relevant COSE Policies:** AQ 1.2, AQ 1.5, AQ 1.8

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | Other |
| County Costs: | Low |
| Community Costs: | Low |
| Community Savings: | Medium-High |
| Performance Indicators: | Participation in SLO Regional Rideshare programs and events |

### 25. Alternative Fuels

Continue to expand the use and availability of alternative and low carbon fuels for vehicles and equipment.

**Supporting Actions:**

- Create a Neighborhood Electric Vehicle (NEV) network by identifying streets and locations appropriate for NEV use in the Circulation Element.
- Encourage existing car-sharing companies in San Luis Obispo County to expand to additional communities within the county.
- Participate in countywide efforts to establish an alternative fuel infrastructure network.
- Support and facilitate the development of alternative fuel technologies such as the installation of new or retrofit of electric vehicle charging stations and alternative fueling stations.

**Emissions Reductions**

2020:

5,280 $MTCO_2e/yr$

2035:

-11,170 $MTCO_2e/yr$

**Co-Benefits**







- Ensure that alternative fuel stations and support facilities are allowed uses in land use designations that currently allow gas and service stations.

- Revise parking requirements for public and new commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.

- Continue to participate in the Air Pollution Control District's Central Coast Clean Cities Coalition (C5) program.

**Program Description:**

The expanded use and purchase of alternative fuel vehicles within San Luis Obispo County will rely heavily on the availability of these fuels. By creating a network of alternative fuel and electric vehicle charging stations and by promoting the available incentives to purchase alternative fuel vehicles, the County will ensure that there is a market demand for these vehicles that produce little or no direct GHG emissions.

**Relevant COSE Policies:** AQ 2.5, AQ 2.6

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | Other |
| County Costs: | Medium |
| Community Costs: | Medium |
| Community Savings: | Medium-High |
| Performance Indicators: | Number of alternative fueling or charging stations<br>Participation in car-share programs |



## WATER CONSERVATION

**GOAL: REDUCE EMISSIONS FROM POTABLE WATER USE BY 20% FROM PER CAPITA BASELINE LEVELS BY 2020 BY PRIORITIZING WATER CONSERVATION BEFORE DEVELOPMENT OF NEW WATER RESOURCES.**

The use of water requires energy to pump, treat, distribute, collect, and discharge water as it is used by the community. Conservation of water is an important strategy to both reducing energy-related water use and adapting to reduced water availability that may occur due to a changing climate.

Urban water use under this goal analyzes the energy use related to water through new construction and existing development. By reducing water use in new buildings by 20%, the need to procure additional water sources in the future will be reduced. Additionally, water conservation in existing development through appliance rebate programs, retrofit requirements, and native landscaping encouragement will ensure that communities will have an adequate water supply to continue to grow. Table 5-6, Figure 5-9, and Figure 5-10 present summaries of the GHG emissions reductions from water conservation measures presented in this section.

**The Weight of Water**

One gallon of water weighs approximately 8.35 pounds. According to the 2011 Master Water Plan, approximately 200,000 acre-feet of water is pumped around the county each year for urban, rural, and agricultural uses. This amount of water weighs over 272 million tons.

### **Table 5-6.** Water Conservation GHG Emissions Reduction Summary

| # | Measure | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|---|
| 26. | Water Conservation: New Construction | 0 | -80 | -180 |
| 27. | Retrofit Upon Sale | n/a | n/a | n/a |
| 28. | Tiered Water Rates | n/a | n/a | n/a |
| 29. | Water Conservation: Existing Buildings | -10 | -40 | -70 |
| 30. | Water-Efficient Landscape | n/a | n/a | n/a |
| 31. | Recycled Water | n/a | n/a | n/a |

| # | Measure | 2010 $MTCO_2e/yr$ | 2020 $MTCO_2e/yr$ | 2035 $MTCO_2e/yr$ |
|---|---|---|---|---|
| 32. | Greywater & Rainwater | n/a | n/a | n/a |
| **Total** | | **-10** | **-120** | **-250** |



**Figure 5-9.** 2020 Water Conservation GHG Reductions

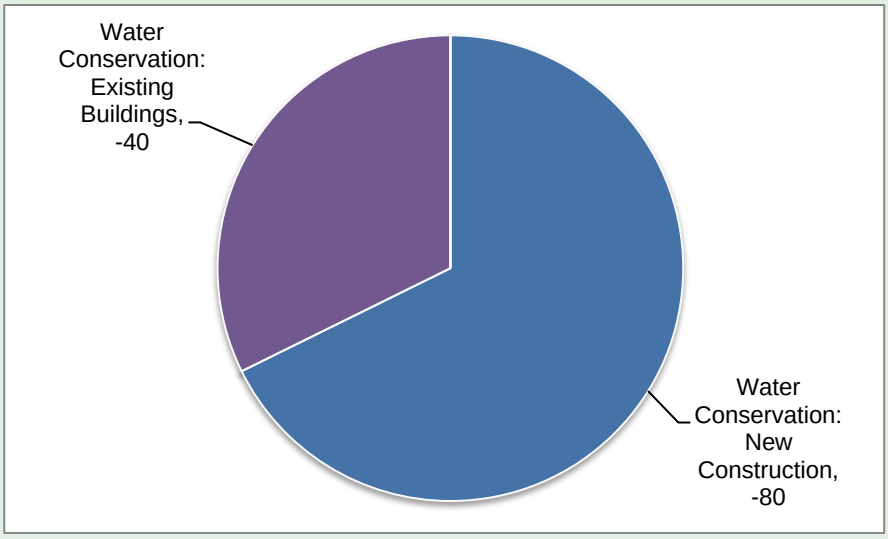
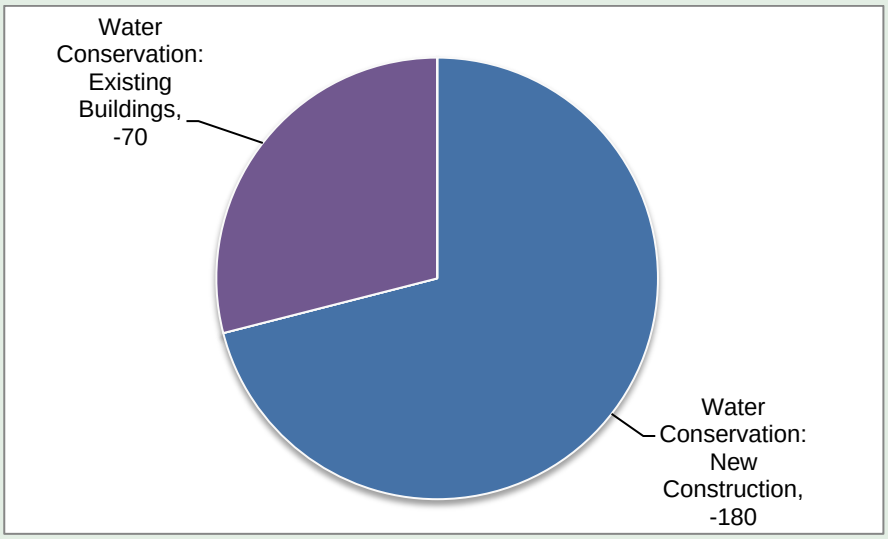



**Figure 5-10.** 2035 Water Conservation GHG Reductions




**Water Use in SLO County**

Urban, rural, and agriculture uses in the county utilize approximately 200,000 acre-feet of water every year. That's equivalent to 65 billion gallons of water each year.



### 26. Water Conservation: New Construction

Reduce potable water use by 20% in all newly constructed buildings by using the prescriptive or performance method provided in the California Green Building Code to demonstrate compliance.

**Program Description:**

This measure relies on CALGreen's requirement that all new buildings reduce water use by a minimum of 20% through a variety of installation choices. Builders may comply with the requirements by installing fixtures that do not exceed maximum flow rates or by demonstrating that the building will achieve a 20% reduction in water use through alternative methods.

**Relevant COSE Policies:** WR 1.2, WR 4.1

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | New development |
| County Costs: | Low |
| Community Costs: | Low |
| Community Savings: | Medium-High |
| Performance Indicators: | 20% water savings from new development |

**Emissions Reductions**

2020:

-80 $MTCO_2e/yr$

2035:

-180 $MTCO_2e/yr$

**Co-Benefits**





### 27. Water Conservation Retrofit

Continue to enforce retrofit upon sale requirements in Los Osos and the Nipomo Mesa and facilitate compliance with SB 407 in residential and commercial properties in other unincorporated areas of the County.



**Program Description:**

In an effort to conserve water from old and outdated plumbing fixtures, the County has implemented a retrofit upon sale requirement for residents and businesses on the Nipomo Mesa and in Los Osos. This requirement ensures that buildings utilizing inefficient water fixtures will be updated over time as buildings are sold. In addition to enforcing the existing retrofit upon sale programs, the County will work with residential and commercial property owners to comply with the requirements of Senate Bill 407, which requires:

- By 1-1-14 specified improvements to single family residences will require water conserving fixtures.
- By 1-1-14 specified improvements to multifamily and commercial buildings will require water conserving fixtures.
- On or after 1-1-17 sellers of single family residences must disclose requirements for replacing plumbing fixtures and the property's compliance with the requirement.
- On or after 1-1-19 sellers of multifamily and commercial buildings must disclose requirements for replacing plumbing fixtures and the property's compliance with the requirement.
- By January 1, 2019, all noncompliant plumbing fixtures in multifamily residential real property and commercial real property, as defined, must be replaced with water conserving plumbing fixtures.

**Relevant COSE Policies:** WR 4.1

**Emissions Reductions**

2020:

Included in Water Conservation: Existing Buildings

2035:

Included in Water Conservation: Existing Buildings

**Co-Benefits**







**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Near-Term |
| Applicability: | Existing development |
| County Costs: | Low-Mid |
| Community Costs: | Low-Mid |
| Community Savings: | Medium |
| Performance Indicators: | Number of homes and businesses retrofitted |

## 28. Tiered Water Rates

Implement tiered water rate structures to incentivize water conservation.

**Supporting Actions:**

- Evaluate existing tiered water rates for incorporated cities and CSDs within the county to determine the most effective rate structures to incentivize water conservation in County Service Areas.
- Through the Resource Management System, the County will track the use of tiered water rates in all water supplier areas in the county.

**Program Description:**

The implementation of tiered water rates will encourage water conservation by charging less per unit for lower-volume water users and charging high-volume water users at a higher rate per unit. Tiered water rates reward customers that use water efficiently, and many water providers throughout California and the southwest have implemented tiered water rates to promote water conservation. This measure would only be applicable to water users that are provided with water from San Luis Obispo County.

**Relevant COSE Policies:** WR 4.2

**Emissions Reductions**

2020:

Included in Water Conservation: Existing Buildings

2035:

Included in Water Conservation: Existing Buildings

**Co-Benefits**



**Implementation:**

| Responsible Department: | Public Works |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New and existing development |
| County Costs: | Medium |
| Community Costs: | Low-Mid |
| Community Savings: | Low-Mid |
| Performance Indicators: | Gallons of water saved |

### 29. Water Conservation: Existing Buildings

Work with local CSDs to continue to implement indoor and outdoor conservation and rebate programs.

**Supporting Actions:**

- Identify per capita water use baselines, using subregional or community data where available.
- Encourage homeowners, landlords, and tenants to install energy- and water-efficient fixtures and equipment.

**Program Description:**

Many of the CSDs within San Luis Obispo County are already actively promoting water conservation efforts by providing residents with water conservation kits and rebates to exchange washers, and providing rebates to replace turf lawns with low-irrigation native landscaping.

**Relevant COSE Policies:** WR 4.1

**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | Existing development |
| County Costs: | Low |



**Emissions Reductions**

2010:

-10 $MTCO_2e/yr$

2020:

-40 $MTCO_2e/yr$

2035:

-70 $MTCO_2e/yr$

**Co-Benefits**





**Emissions Reductions**

2020:

Included in Water Conservation: New Development

2035:

Included in Water Conservation: New Development

**Co-Benefits**



| | |
|---|---|
| Community Costs: | Low |
| Community Savings: | Low-Mid |
| Performance Indicators: | Gallons of water saved |

### 30. Water-Efficient Landscape

Reduce outdoor water use in new landscapes through compliance with the County's Water-Efficient Landscape Ordinance.

**Supporting Actions:**

- Turf will not exceed 20% of the total site area on parcels 1 acre or less and 20% of landscaped areas on parcels greater than 1 acre.
- Irrigation controllers will have rain sensors.

**Program Description:**

This measure will apply to all new buildings with landscaping areas and all renovated landscapes larger than 1,000 square feet. By limiting the amount of turf and installing irrigation controls for landscaped areas, water used to irrigate landscapes will be minimized.

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Immediate |
| Applicability: | New development and renovated landscapes |
| County Costs: | Low |
| Community Costs: | Low-Mid |
| Community Savings: | Low-Mid |
| Performance Indicators: | Gallons of water saved |

### 31. Recycled Water

Increase the availability and use of recycled water for use in outdoor landscaping areas.

**Program Description:**

Using non-potable water for landscape and irrigation purposes is less energy-intensive than the process of treating and pumping potable water. Recycled water can be sent to the water treatment plant and then sent to properties with dual plumbing for irrigation purposes. Using recycled water will help to preserve the local water supply and reduce the amount of electricity needed to convey, pump, and treat the water used in households and businesses.

**Relevant COSE Policies:** WR 1.4

**Implementation:**

| **Responsible Department:** | **Public Works** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | New and existing development |
| County Costs: | Medium-High |
| Community Costs: | Minimal |
| Community Savings: | Minimal |
| Performance Indicators: | Acre-feet of recycled water used |



**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

### 32. Greywater & Rainwater

Encourage the installation and use of greywater and rainwater harvesting systems to reduce outdoor potable water use.

**Supporting Actions:**

- Develop and adopt a graywater ordinance and program, including public education that showcases successful local examples of graywater systems that facilitate the reuse of domestic wastewater for on-site irrigation and other water conservation measures, as appropriate.

**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified



**Program Description:**

Using greywater and rainwater for landscape and irrigation purposes is less energy-intensive than the process of treating and pumping potable water. Greywater is treated and reused on site, while rainwater is collected for use in fixtures with dual plumbing or for landscape irrigation. Using greywater or rainwater will help to preserve the local water supply and reduce the amount of electricity needed to convey, pump, and treat the water used in households and businesses.

**Relevant COSE Policies:** WR 1.4

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | New and existing development |
| County Costs: | Minimal |
| Community Costs: | Low |
| Community Savings: | Low-Mid |
| Performance Indicators: | Number of greywater and rainwater systems installed |



## AGRICULTURE

### GOAL: REDUCE EMISSIONS IN AGRICULTURAL PRACTICES THROUGH ENERGY CONSERVATION, UPGRADE OF EQUIPMENT TECHNOLOGY, AND USE OF BEST MANAGEMENT PRACTICES.

Agriculture is an important GHG emissions source to be considered and quantified at local, state, and federal levels. In 2008, agriculture contributed approximately 6% of California's total GHG emissions,[1] approximately equivalent to the proportion of emissions resulting from agriculture nationwide (6%).[2] These seemingly small percentages should not obscure agriculture's direct impact on GHG emissions. Nationwide, agricultural activities were the single largest source of all nitrous oxide ($N_2O$) emissions, contributing almost 68% of all $N_2O$. Further, agriculture contributes approximately 35% of all methane ($CH_4$) emissions nationwide.[3]

The County recognizes that agriculture is one of its most important resources and critical economic drivers. Integrating agriculture into the County's inventory and GHG reduction strategies allows the County and local agriculturalists to retain a higher degree of local control (where appropriate). Inventorying local GHG emissions from agriculture sources follows the best available protocol with the recognition that methodologies and assumptions will change and improve over time. The existing GHG inventory is a valuable foundation, setting the stage for engagement and an ongoing dialogue about the best methods to identify, measure, and reduce local GHG emissions.

The local agricultural community has been actively engaged to understand their impact on climate change and develop self-propelled initiatives. This Plan is an opportunity for the County to support ongoing efforts, to facilitate future activities to the extent practicable, and to become a resource on climate change and energy efficiency.

[1] California Air Resources Board. 2010.

[2] U.S. Environmental Protection Agency. 2011.

[3] Ibid.



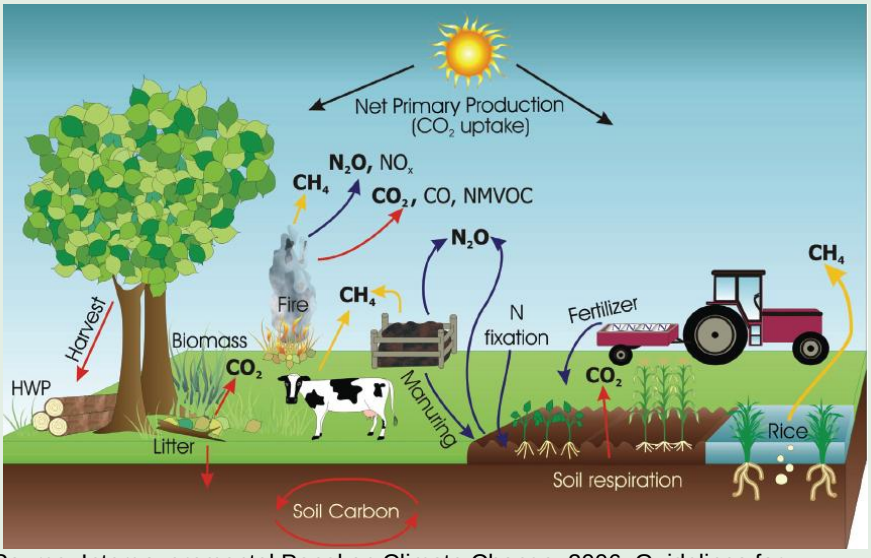
Agriculture is a managed form of land use where human intervention affects both biological processes that involve the transformation of carbon and nitrogen and physical processes such as leaching and runoff. Agricultural activities create direct and indirect GHG emissions through multiple processes including fuel combustion in agricultural off-road equipment, crop and soil management practices, including soil fertilization and pest management, and emissions from cattle and other livestock.

Local and statewide agriculture related GHG emissions result from a highly intensive modern industry sustained by ongoing human activities. Crop yields are dependent on inputs of fertilizer, manure, and pesticides that both directly and indirectly release GHGs. Other practices, such as the application of lime to the soil, work to achieve targeted levels of nutrients in the soil necessary to support agriculture. Practices vary by crop type, soil type, and terrain, among other factors. Note that while there has been a rise in organic farming and less intensive agricultural practices throughout the state, most agricultural enterprise is characterized by a reliance on synthetic fertilizers.

**Figure 5-11** depicts the agricultural cycle. Although each process of the cycle is unique, for the purposes of the community-wide GHG inventory and GHG reduction strategy, they can be grouped into three categories: (1) crop production, (2) livestock, and (3) agricultural equipment. These categories capture the primary agricultural activity or source that creates local GHG emissions.



**Figure 5-11.** Primary Greenhouse Gas Emissions Sources and Removals in an Agricultural System




Source: Intergovernmental Panel on Climate Change. 2006. Guidelines for National Greenhouse Gas inventories, Volume 4: Agriculture, Forestry, and Other Land Use.

All components of the cycle are not appropriate for inclusion in the County's GHG inventory and reduction strategy. The inventory and reduction strategy are focused on the following components.

- **Crop production** includes any process emissions pertaining to the establishment, harvesting, or decomposition of crops. Crop production includes the application of fertilizer and pesticides, and though not typical in SLO County, crop burning. These human-induced activities result in direct emissions within a local government's geographical boundary and are classified as Scope 1 emissions.

- **Livestock** includes the emissions from all ruminant animals. GHGs result from the special process of enteric fermentation that takes place within ruminant digestive systems, and through manure decomposition. Once livestock exists in any given place, livestock emissions take place apart from human intervention. These are classified as Scope 3 emissions, those which the local government has an interest in but no direct control over.





Collaboration and research among agency, institutional, and agricultural organizations are necessary to assess opportunities for sequestration to serve as a local mitigation opportunity.

- **Agricultural equipment** includes the combustion of fuel in all off-road agricultural equipment, including tractors and other types of fuel-powered farm machinery.

This Plan recognizes that there are other emissions and reduction opportunities directly or indirectly related to agricultural activity. Additional emission sources include GHGs resulting from the energy consumed to treat, move, and dispose of water as well as energy and water needed to support other on-site activities related to crop production and agricultural operations. At this time, energy emissions are included in the larger energy sector of the County's inventory; however, energy-related reduction measures are included in this section for reference and best practice.

Opportunities related to GHG emissions and the agriculture sector include storage and sequestration of $CO_2$. Sequestration is an emerging field of research in agriculture and natural resource management. At this time, the exact role of local resources, including agriculture, is largely unknown. Collaboration and research among agency, institutional, and agricultural organizations are necessary to assess opportunities for sequestration to serve as a local mitigation opportunity.

The inclusion of the agriculture sector as emissions source in the County's baseline GHG inventory presents an opportunity to recognize the diverse and proactive local resource protection and energy efficiency programs in place as well as the suite of state and federal regulatory mechanisms in place. The intent of the following reduction measures is to complement and support ongoing activities and to clearly identify those existing or anticipated programs that support the reduction of GHGs. Table 5-7 presents the summary of GHG emissions estimated from the agriculture sector. The detailed measures and actions follow.



**Table 5-7.** Agriculture GHG Emissions Reduction Summary

| # | Measure | 2020 | 2035 |
|---|---|---|---|
| 33. | Agriculture Resource Conservation | n/a | n/a |
| 34. | Soil & Crop Management | n/a | n/a |
| 35. | Livestock Management | n/a | n/a |
| 36. | Off-Road Equipment | -2,810 | -5,270 |
| 37. | Local Foods | n/a | n/a |
| 38. | Agricultural Employee Transportation | Included in Commute Trip Reduction programs | Included in Commute Trip Reduction programs |
| 39. | Sequestration | n/a | n/a |
| | **Total** | **-2,810** | **-5,270** |

**Sustainability in Agriculture**

Agricultural organizations in SLO County have a long history of implementing sustainable practices and programs. Education, self-assessments, and certification programs are valuable resources agriculturalists can use to conserve resources on their land. Examples of current programs available include:

1. Workshops through UC Cooperative Extension and PG&E;
2. Self-assessment programs such as the Ranching Sustainability Analysis developed by UCCE; and
3. Certifications programs such as Sustainability in Practice (SIP) Certification for vineyards or the VeriFlora program for nurseries.



**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

**Co-Benefits**





### 33. Agriculture Resource Conservation

Encourage voluntary energy conservation through appropriate and practicable efficient energy, water, and resource management practices.

**Supporting Actions:**

- Support the voluntary installation of energy-efficient irrigation systems and other energy conservation system devices.
- Encourage the U.C. Cooperative Extension to continue its public information and research program describing water conservation techniques that may be appropriate to agricultural practices in this county which may reduce the use of combustible fuels.
- Encourage landowners to participate in voluntary energy conservation programs through the provision of incentives.
- Evaluate potential efficiency improvements in agriculture-related groundwater delivery.
- Encourage the State to enact legislation that promotes environmentally sustainable farming practices.
- Encourage participation in self-assessments and certification programs.

**Program Description:**

The County will continue to work with organizations such as UCCE, Resource Conservation Districts, non-governmental organizations, and agriculturists to conserve energy, water, and other resources through educational, self-assessment, and certification programs. By offering a breadth of programs and events, the agriculture community can participate in the programs that are most appropriate and will have the highest value to their operations.

**Implementation:**

| Responsible Department: | Planning and Building |
|---|---|
| Implementation Time Frame: | Near-Term |
| Applicability: | Agriculture operations |
| County Costs: | Low |
| Community Costs: | Low |
| Community Savings: | Low-Mid |
| Performance Indicators: | Participation in conservation programs sponsored by UCCE, RCD and NGOs. |



### 34. Soil & Crop Management

**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

The County will collaborate with Cal Poly, agriculturalists, the University of California Cooperative Extension (UCCE), and the County's resource conservation districts (RCDs) to develop and disseminate appropriate voluntary management practices for the application of pesticides and fertilizers, tillage practices, cover crops, and other techniques to reduce nitrous oxide emissions, maximize carbon sequestration, and reduce fuel use.

**Supporting Actions:**

- Explore conservation and stewardship programs and specialty crop research initiatives to fund GHG reduction programs.

**Program Description:**

The County and UCCE will research and develop recommendations for reducing GHG emissions associated with soil and crop management, and encourage agriculture operators to continue to implement management practices without compromising the agricultural productivity of these lands.

**Implementation:**

| Responsible Department: | Agricultural Commissioner |
|---|---|
| Implementation Time Frame: | Mid-Term |



| | |
|---|---|
| Applicability: | Agriculture operations |
| County Costs: | Minimal |
| Community Costs: | Low |
| Community Savings: | Low |
| Performance Indicators: | Crop fertilization rates per acre |

**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

### 35. Livestock Management

Implement a voluntary fermentation and manure management program.

**Supporting Actions:**

- Support research and pilot programs to implement best practices.

**Program Description:**

Methane from livestock accounts for roughly 10% of total community-wide emissions. Technical providers will work with researchers to identify technologies and best practices to reduce methane emissions from livestock. These best practices may include manure collection methods, grazing management, nutrient supplements, or other innovative methods.

**Implementation:**

| **Responsible Department:** | **Agricultural Commissioner** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | Livestock operations |
| County Costs: | Minimal |
| Community Costs: | Low |
| Community Savings: | Low |
| Performance Indicators: | none |

### 36. Off-Road Equipment

Reduce fuel use and GHG emissions from off-road agricultural equipment.

**Supporting Actions:**

- Support SLO County Air Pollution Control District (APCD) programs to fund equipment upgrades, retrofits, and replacement through the Carl Moyer heavy-duty vehicle and equipment program or other funding mechanisms.
- Work with the APCD and agriculturalists to identify practical and feasible options for fuel-efficient agricultural equipment.

**Program Description:**

This program will support the existing efforts of the APCD to provide rebates or financing for retrofitting and replacing both on- and off-road heavy-duty equipment and vehicles through the Carl Moyer program. Additional education will be provided through the APCD on best maintenance and operations practices of off-road vehicles to maximize fuel efficiency

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | Agriculture operations |
| County Costs: | Medium |
| Community Costs: | Medium-High |
| Community Savings: | Medium |
| Performance Indicators: | Number of zero-emissions and fuel-efficient tractors |



**Emissions Reductions**

2020:

-2,810MTCO$_2$e/yr

2035:

-5,270 MTCO$_2$e/yr

**Co-Benefits**



**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

**Co-Benefits**





## 37. Local Foods

Reduce emissions from transport of agriculture-related products within the county through the encouragement of local food programs.

**Supporting Actions:**

- Support food systems/food shed program and develop implementation policies.
- Support the development of community garden programs in unincorporated communities.
- Continue support of local initiatives to increase local sales of produce grown in SLO County and other agricultural products, including but not limited to the "SLO Grown" campaign and the permitting of local farmers markets.
- Encourage procurement of locally grown and/or produced food for all county events.
- Encourage County vendors and concessionaires to procure and provide locally grown and/or produced food.
- Support and promote the USDA "Farm to School Initiative" and "Know Your Farmer, Know Your Food" programs.
- Create a local foods program to support food security, local economic development, health, and other benefits.

**Program Description:**

The County recognizes that encouraging relationships between local producers and consumers is an important component of maintaining a vibrant local economy and in building on existing agricultural assets. Local and accessible farmers markets are a valuable strategy to build community identity, provide opportunities for local entertainment, and encourage healthier eating. Farmers markets or other agricultural-based events will strengthen the local identity with the local agricultural heritage; these forums also

provide an important opportunity for educational and outreach programs that are outlined elsewhere in this Plan.

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| Applicability: | Other |
| County Costs: | Low |
| Community Costs: | Low |
| Community Savings: | Low |
| Performance Indicators: | Number of community gardens<br>Number of farmers markets |

### 38. Agricultural Employee Transportation

Reduce VMT associated with commuting by agricultural workers.

**Supporting Actions:**

- Support rideshare programs for agricultural worker transit, shuttles, and ride matching.
- Publicize the availability of this program to the agricultural community.

**Program Description:**

In 2008, SLOCOG was awarded a grant from Caltrans to implement a vanpool program for farm workers to provide safe, reliable, and affordable transportation options to commute to and from rural worksites. The grant will allow SLOCOG to purchase and operate eight 15-passenger vans to transport farm workers and provides funding to market and promote the program.

**Relevant COSE Policies:** AQ 1.5

**Implementation:**




**Emissions Reductions**

2020:

Supporting Measure – Included in Commute Trip Reduction Programs

2035:

Supporting Measure – Included in Commute Trip Reduction Programs

**Co-Benefits**





| Responsible Department: | SLOCOG |
|---|---|
| Implementation Time Frame: | Ongoing |
| Applicability: | Agriculture operations |
| County Costs: | Minimal |
| Community Costs: | Low |
| Community Savings: | Low-Mid |
| Performance Indicators: | Participation in SLO Regional Rideshare programs |

### 39. Sequestration

Identify opportunities for terrestrial and aquatic sequestration in the county, including but not limited to County lands, reclaimed mining lands, agricultural lands, and other areas as appropriate.

**Supporting Actions:**

- Support preparation of a countywide sequestration assessment of agricultural and open space lands, forests, and aquatic resources.
- Support research and implementation through the development of a working group to convene agriculturalists, researchers, and other experts to explore local opportunities and best practices to capture and store carbon.
- Explore opportunities for carbon sequestration to be integrated with existing open space acquisition for conservation programs.
- Explore opportunities for carbon sequestration to be integrated with natural resource or conservation-based mitigation banking and offset programs.

**Program Description:**

Carbon sequestration is the net removal of $CO_2$ from the atmosphere. This may occur through the enhancement of natural processes (i.e., terrestrial sequestration—the uptake of carbon by

**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

**Co-Benefits**



trees, vegetation, and soils) or through technological processes, such as the placement of $CO_2$ into a geologic repository (geologic sequestration) in such a way that it will remain permanently sequestered. The term "carbon sinks" is also used to describe agricultural and forestry lands that absorb $CO_2$. This measure directs the County to explore opportunities to sequester carbon from the atmosphere.

**Relevant COSE Policies:** AQ 4.5

**Implementation:**

| **Responsible Department:** | **Planning and Building** |
|---|---|
| Implementation Time Frame: | Long-Term |
| Applicability: | Other |
| County Costs: | Medium |
| Community Costs: | Low-Mid |
| Community Savings: | Low-Mid |
| Performance Indicators: | Acres of land used to sequester carbon |



# 6 – COUNTY GOVERNMENT OPERATIONS ENERGY AND GREENHOUSE GAS REDUCTIONS

# COUNTY OPERATIONS REDUCTION MEASURE SUMMARY



The EnergyWise Plan puts the County in a leadership position to reduce GHG emissions and to become more energy efficient.

### Reduction Measure Topic Areas and Goals

The Conservation and Open Space Element (COSE) of the General Plan directs a 15% reduction (from 2006 levels) in greenhouse gas emissions from County operations by 2020. In order to achieve that target, the County will need to implement the reduction measures presented in this chapter. The reduction measures are organized by topic area and goal consistent with the sources of greenhouse gas (GHG) emissions from County operations as presented in the GHG Inventory (**Chapter 3**). Reduction measure topics areas include:

- Energy efficiency & conservation
- Renewable energy
- Waste reduction
- Vehicle fleet
- Employee commute
- Water conservation

Each topic area includes a goal, a set of reduction measures, and supporting actions for each measure to demonstrate how the goals will be achieved.

Implementation of the GHG reduction measures presented in this chapter will achieve the County's GHG emissions reduction target as well as the following County goals directed by the COSE.

- Energy Efficiency & Conservation: Reduce energy use in existing County facilities 20% by 2020.
- Renewable Energy: Increase the use of renewable energy sources in County facilities to account for 10% of total energy used.

# COUNTY GOVERNMENT OPERATIONS ENERGY AND GREENHOUSE GAS REDUCTIONS



Employee commuting is 46% of all GHG emissions associated with County operations.

- Waste Reduction: Reduce the amount of waste generated at County facilities and increase the County's waste diversion rate to 80% by 2020.
- Vehicle Fleet: Reduce emissions from the County's vehicle fleet by using alternative fuels and decreasing vehicle miles traveled.
- Employee Commute: Provide additional opportunities for employees to utilize alternative transportation options and reduce commute lengths.
- Water Conservation: Reduce water use in County facilities 20% by 2020.

## Reduction Measure Organization

### *Policy and Supporting Actions*

Each reduction measure includes the measure language, supporting actions, and a description of what the program will include. Many of the reduction measures will assist in the implementation of the Conservation and Open Space Element policies. The COSE policies that will be implemented through the Plan are listed with each measure.

### *Implementation*

An implementation table is provided for each GHG reduction measure, which identifies the County agency that will be responsible for the implementation of the measure, the time frame for implementation, ranges of the costs and savings that will be associated with the measure, and the indicators that will be used to measure progress. The time frame and costs/savings ranges used throughout this chapter are provided below.



| Time Frame | |
|---|---|
| Ongoing | Continual |
| Immediate | 0–1 Year |
| Near-Term | 1–5 Years |
| Mid-Term | 5–10 Years |
| Long-Term | 10+ Years |

| Costs/Savings | |
|---|---|
| Minimal | 0 |
| Low | $1–$25,000 |
| Low-Mid | $25–$100,000 |
| Medium | $100,000–$200,000 |
| Medium-High | $200,000–$500,000 |
| High | Over $500,000 |

### *GHG Emissions Reduction*

When sufficient information is available, emissions reduction measures have been quantified to indicate the contribution that a measure will have to overall GHG reductions. This number is presented in $MTCO_2e$ reduced per year. In some cases, the GHG reduction benefit is not quantifiable on its own but is included in another strategy. Other measures may not have a direct GHG reduction benefit but are critical to the success of other GHG reduction strategies.

### *Co-Benefits*

In addition to reducing GHG emissions, many measures will provide numerous co-benefits to the community while furthering the sustainability goals of the County. These co-benefits are depicted in this document by graphic symbols as presented in **Figure 6-1**.



**Figure 6-1.** GHG Reduction Measure Co-Benefit




The assumptions, sources, and methodology used for each measure are provided in a detailed technical appendix (**Appendix D**), and further information about the implementation of each measure is included in **Chapter 8**.

## ENERGY EFFICIENCY & CONSERVATION

**GOAL: REDUCE ENERGY USE IN EXISTING COUNTY FACILITIES 20% BY 2020.**

### 1. Facility Energy Efficiency

Continue to retrofit existing County facilities and implement energy conservation measures and efficiency programs.

**Supporting Actions:**

- Implement HVAC and lighting retrofits as identified in energy audits.
- Complete weatherization measures and HVAC adjustments to improve occupant thermal comfort and reduce the use of personal heating and cooling devices.
- Identify and implement energy-saving measures when leasing or purchasing additional facilities for County use.
- Incorporate demonstration and educational energy conservation measures improvements into County facilities.
- Continue to pursue funding sources to implement additional energy efficiency measures at existing County facilities, including grants, low-interest loans, and reinvestment of energy cost savings from retrofits already completed.

**Sustainability in Practice:**

In 2009, the County received a grant through the American Recovery and Reinvestment Act's Energy Efficiency Conservation Block Grant (EECBG) program. A portion of the grant has been devoted to auditing and retrofitting HVAC and outdoor lighting systems at existing County facilities. Following completion of these retrofits, the County will identify additional energy conservation measure to be implemented and potential funding sources to complete the retrofits.

**Relevant COSE Policies:** AQ 4.3.3, E 1.3.1



**Emissions Reductions**

2010:

-60 $MTCO_2e/yr$

2020:

-370 $MTCO_2e/yr$

2035:

-400 $MTCO_2e/yr$

**Co-Benefits**





**Emissions Reductions**

2020:

-90 $MTCO_2e/yr$

2035:

-80 $MTCO_2e/yr$

**Co-Benefits**





**Implementation:**

| Responsible Department: | General Services Agency |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Medium |
| County Savings: | Medium |
| Performance Indicators: | Number of facilities retrofitted<br>Energy savings at County facilities |

## 2. Energy Conservation & Education

Promote energy conservation through educational and competition-based programs.

**Supporting Actions:**

- Enroll and participate in the Energy Star Challenge.
- Develop a competition among County departments to conserve energy.

**Sustainability in Practice:**

Current efforts by the County to distribute energy conservation education include the distribution of Flex Your Power flyers and reminders to departments about thermostat guidelines and the need to conserve energy, typically when transitioning from warmer to cooler weather and vice versa. This measure will direct the development of an energy conservation competition among departments to further expand participation by County employees in energy conservation.

**Relevant COSE Policies:** AQ 4.3.3, E 1.3, E 3.4

**Implementation:**

| Responsible Department: | County Green Team |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Low |

| | |
|---|---|
| County Savings: | Low-Mid |
| Performance Indicators: | Participation in energy conservation programs<br>Energy savings at County facilities |



### 3. Computer Network Upgrades

Reduce computer energy use through software, hardware, and network upgrades.

**Emissions Reductions**

2020:

-10 $MTCO_2e/yr$

2035:

-30 $MTCO_2e/yr$

**Co-Benefits**



**Supporting Actions:**

- Upgrade remote access capabilities to allow employees to access the network remotely rather than through County desktop computers.
- Require all new computers, monitors, and office equipment to be Energy Star certified.

**Sustainability in Practice:**

Computer monitors and office equipment that is left on when not in use can contribute significantly to the County's energy costs. The energy reductions of this measure rely on two actions: ensure that computers do not need to be left on overnight for employee remote access, and require that all new computer and office equipment is Energy Star certified, ensuring that the County has the most energy-efficient equipment.

**Relevant COSE Policies:** AQ 4.3.3, E 1.3.1

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Low |
| County Savings: | Low |
| Performance Indicators: | Number of Energy Star certified computers, monitors, and pieces of office equipment |



**Emissions Reductions**

2020:

Supporting Measure – Not Quantified

2035:

Supporting Measure – Not Quantified

**Co-Benefits**





### 4. Operations & Maintenance

Develop green building operation and maintenance guidelines to be followed by County employees and contractors.

**Sustainability in Practice:**

The development of operations and maintenance manual, or the update of the current procedures manual, will ensure that the County's new and existing facilities continue to function in an efficient and healthy manner. The guidelines will include, at a minimum, use of recycled-content, formaldehyde-free fiberglass insulation cellulose insulation or other natural insulation products; no- or low-volatile organic compounds (VOC); formaldehyde-free paints, stains, and adhesives; no- or low-VOC furniture, particleboard, and cabinetry; and utilization of exposed concrete as a finished floor.

**Relevant COSE Policies:** E 4.3

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Near-Term |
| County Costs: | Low |
| County Savings: | Low |
| Performance Indicators: | None |

### 5. Tree Planting

Continue to plant trees for building shading and carbon sequestration purposes.

**Supporting Actions:**

- Plant additional deciduous trees along south-, east-, or west-facing walls to reduce building heat gain where the trees will not interfere with sewer laterals and/or photovoltaic installations.
- Continue to replace damaged or diseased trees and plant additional trees at County parks and golf courses.
- Continue to plant trees in County parks through the Parks Foundation Plant-a-Tree donation program.
- Encourage tree mitigation projects on County parks and lands.

**Sustainability in Practice:**

Trees have multiple GHG reduction benefits including carbon sequestration, shading effects on buildings, and urban heat island mitigation. By planting trees at County facilities, the County can reduce electricity costs from nearby buildings and sequester carbon through the planting of additional trees at County parks and golf courses.

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Low-Mid |
| County Savings: | Low |
| Performance Indicators: | Number of trees planted |

### 6. Streetlights & Traffic Signals

Replace lighting and traffic signal fixtures with more efficient light-emitting diode (LED) lighting.



**Emissions Reductions**

2010:

-30 $MTCO_2e/yr$

2020:

-70 $MTCO_2e/yr$

2035:

-120 $MTCO_2e/yr$

**Co-Benefits**







**Emissions Reductions**

2020:

-20 $MTCO_2e/yr$

2035:

-30 $MTCO_2e/yr$

**Co-Benefits**



**Supporting Actions:**

- Retrofit streetlights with LED lighting technology.
- Retrofit traffic signals with LED light fixtures.

**Sustainability in Practice:**

This measure quantifies the effect of replacing all streetlights with energy-efficient models. The County has received grant funding through the EECBG program to replace 18 of the County's traffic signals. Completion of this measure assumes additional action and investment is taken by the County to replace the remaining lights not funded by the EECBG program. Additional programs that the County can pursue in conjunction with Pacific Gas and Electric (PG&E) include loan programs provided by the California Energy Commission.

**Implementation:**

| **Responsible Department:** | **Public Works** |
|---|---|
| Implementation Time Frame: | Near-Term |
| County Costs: | Low |
| County Savings: | Low-Mid |
| Performance Indicators: | Number of streetlights and traffic signals retrofitted |

### 7. New Facilities

Require new or renovated County facilities to meet or exceed CALGreen's Tier 1 or the intent of the LEED Silver requirements.

**Supporting Actions:**

- Continue to require Utility Coordinator review of new facilities for opportunities to meet or exceed energy efficiency requirements.

- Orient and design new facilities to maximize natural lighting and climate regulation.
- "Right-size" new facilities to meet anticipated uses.
- Pre-wire new facilities to accommodate solar PV and/or electric car charging stations.

**Sustainability in Practice:**

SLO County will lead by example in developing new facilities that meet or exceed the CALGreen Tier 1 requirements or the intent of the LEED Silver requirements. Building facilities that meet these standards will ensure that the County's future energy use is minimized. Additionally, these public buildings will demonstrate to the community sustainable building practices and their effective implementation.

**Relevant COSE Policies:** E 2.1

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low-Mid |
| County Savings: | Medium |
| Performance Indicators: | Number of facilities meeting Tier 1 or LEED Silver requirements |



**Emissions Reductions**

2020:

-260 $MTCO_2e/yr$

2035:

-700 $MTCO_2e/yr$

**Co-Benefits**











**Emissions Reductions**

2010:

-120 $MTCO_2e/yr$

2020:

-700 $MTCO_2e/yr$

2035:

-820 $MTCO_2e/yr$

**Co-Benefits**




## RENEWABLE ENERGY

**GOAL: INCREASE THE USE OF RENEWABLE ENERGY SOURCES IN COUNTY FACILITIES TO ACCOUNT FOR 10% OF TOTAL ENERGY USED.**

### 8. Renewable Energy

Explore opportunities to install alternative energy and co-generation facilities.

**Supporting Actions:**

- Install solar PV on facilities with adequate space and orientation.
- Consider use of solar equipment to support lighting facilities at County parks, parking lots, restrooms, and for irrigation pumping.
- Install co-generation equipment at County facilities.
- Install renewable energy systems like co-generation or solar thermal hot water equipment at County pool facilities.
- Seek funding or financing opportunities for renewable energy installations on County facilities.

**Sustainability in Practice:**

This is the second part of a multi-tiered approach to reduce conventional energy consumption and associated GHG emissions in County facilities. The County will continue to install renewable energy systems at County facilities, including photovoltaic arrays and co-generation facilities.

**Relevant COSE Policies:** E 1.3

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | High |
| County Savings: | High |
| Performance Indicators: | Megawatts of renewable energy installed |

## WASTE REDUCTION

**GOAL: REDUCE THE AMOUNT OF WASTE GENERATED AT COUNTY FACILITIES AND INCREASE THE COUNTY'S WASTE DIVERSION RATE TO 80% BY 2020.**



### 9. Park & Golf Course Recycling

Work with the Integrated Waste Management Authority (IWMA) to develop and implement a recycling program at the County's parks and golf courses.

**Sustainability in Practice:**

Many local governments have found it difficult to effectively implement recycling at park facilities, encountering a significant rate of contamination as park users mix food scraps and other waste with glasses and bottles. The County will work with IWMA to develop and implement a program to recycle waste at County-operated parks. Public education will be a key component to the effective implementation of this program to reduce the amount of contamination in recycling bins.

**Relevant COSE Policies:** E 5.2.2

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Medium |
| County Savings: | Low |
| Performance Indicators: | Percentage of parks and golf courses with recycling facilities |

**Emissions Reductions**

2020:

-30 $MTCO_2e/yr$

2035:

-40 $MTCO_2e/yr$

### 10. Paperless Records

Continue to implement paperless records management and reduce the amount of paper purchased.



**Emissions Reductions**

2010:

-10 $MTCO_2e/yr$

2020:

-10 $MTCO_2e/yr$

2035:

-10 $MTCO_2e/yr$

**Supporting Actions:**

- Continue to post public documents, agendas, and staff reports online, and consider charging a fee for printed materials.

**Sustainability in Practice:**

The County has already made significant efforts to reduce the amount of paper used for records management. Since 2005, the County has implemented integrated document management systems within Human Resources, Auditor-Controller, Assessor, Treasurer-Tax Collector, and County Counsel and is working on implementation in the Planning and Building and Public Works departments. Since implementation, the County has achieved a 68% reduction in paper purchasing and printing. This reduction in paper use not only reduces associated costs but will decrease the amount of paper waste disposed at County facilities.

**Relevant COSE Policies:** E 5.2

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low-Mid |
| County Savings: | Medium |
| Performance Indicators: | Annual print counts |

**Emissions Reductions**

2020:

Supporting Action – Not Quantified

2035:

Supporting Action – Not Quantified

**Co-Benefits**



## 11. Environmentally Preferable Purchasing Policy

Develop and implement an environmentally preferable purchasing (EPP) policy to purchase recycled content and toxic-free products for County supplies, equipment, and services and to promote recycling markets.

**Sustainability in Practice:**

The County will develop and implement an environmentally preferable purchasing policy that will direct the County and its contractors on the purchase of environmentally preferable products. The policy will include, at a minimum, direction on the purchasing of:

- Energy-efficient products;
- Recycled-content products;
- Safer chemical products;
- Water-efficient products; and
- Fuel-efficient, environmentally sensitive vehicles.

**Relevant COSE Policies:** E 5.2.1

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Near-Term |
| County Costs: | Low-Mid |
| County Savings: | Low |
| Performance Indicators: | none |

## 12. Compost Facilities

Explore opportunities to compost food and yard waste at County facilities.

**Supporting Actions:**

- Identify the potential facilities where effective composting can be accomplished in addition to green waste.

**Emissions Reductions**

2020:

-80 $MTCO_2e/yr$

2035:

-190 $MTCO_2e/yr$

**Co-Benefits**



**Sustainability in Practice:**

The County will determine high-volume food and green waste disposal facilities and phase in the implementation of food and green waste composting operations. County golf courses are currently working with IWMA to become zero-waste facilities by constructing on-site composting facilities to collect food, paper, and green waste materials. Additional facilities that may implement composting programs include County-operated jails, concessionaires and cafeterias at County parks and facilities, and community centers where events are held.

**Relevant COSE Policies:** E 5.2

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Medium |
| County Savings: | Low-Mid |
| Performance Indicators: | Amount of food waste and green waste diverted at County facilities |

### 13. Construction & Demolition Waste

Require a minimum of 75% of County non-hazardous construction and demolition waste to be salvaged or recycled.

**Supporting Actions:**

- County departments will continue to offer materials and equipment to other county facilities prior to disposal.

**Sustainability in Practice:**

The County will continue to support markets for construction material reuse by recycling a minimum of 75% of the waste from facility renovations, new construction, and infrastructure projects.

**Relevant COSE Policies:** E 5.2

**Emissions Reductions**

2020:

-20 $MTCO_2e/yr$

2035:

-30 $MTCO_2e/yr$

**Co-Benefits**



**Implementation:**

| Responsible Department: | Public Works, General Services Agency |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low |
| County Savings: | Low |
| Performance Indicators: | Percentage of construction and demolition waste diverted from County projects |

## 14. Vehicle Auctions

Continue to auction off retired vehicles and equipment.

**Sustainability in Practice:**

The County currently auctions off underutilized or retired vehicles and equipment on an annual basis. This practice extends the life of these vehicles by allowing them to remain in operation. Alternatively, vehicles can be deconstructed and the parts used to repair other vehicles. Money from the auctioning of County vehicles goes back to each department to purchase new vehicles. This additional revenue can help the departments to afford higher-cost hybrids when replacing vehicles, providing long-term fuel and cost savings.

**Relevant COSE Policies:** E 5.2

**Implementation:**

| Responsible Department: | General Services Agency |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low |
| County Savings: | Medium |
| Performance Indicators: | County fleet size<br>Number of vehicles auctioned |



**Emissions Reductions**

2010:

Supporting Measure – Not Quantified

2020:

Supporting Measure – Not Quantified

2035:

Supporting Measure – Not Quantified



**Emissions Reductions**

2010:

-3 $MTCO_2e/yr$

2020:

-60 $MTCO_2e/yr$

2035:

-110 $MTCO_2e/yr$

**Co-Benefits**

## VEHICLE FLEET

**GOAL: REDUCE EMISSIONS FROM THE COUNTY'S VEHICLE FLEET BY USING ALTERNATIVE FUELS AND DECREASING VEHICLE MILES TRAVELED.**

### 15. Hybrid Vehicles

Substantially increase the number and proportion of alternative fuel, high fuel economy, electric, and hybrid vehicles and use of these vehicles within the County's fleet.

**Supporting Actions:**

- Promote employee use of hybrid vehicles when available over less fuel-efficient vehicles.
- Review ongoing vehicle replacement acquisitions within the County fleet for opportunities to substitute alternative fuel vehicles, hybrid vehicles and all electric vehicles for conventional gasoline powered vehicles.

**Sustainability in Practice:**

To date, Fleet Services has purchased three hybrid vehicles. The County is seeking every opportunity to purchase vehicles that will reduce the consumption of fossil fuels while reducing County vehicle operations and maintenance costs.

**Relevant COSE Policies:** AQ 2.3

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low-Mid |
| County Savings: | Low-Mid |
| Performance Indicators: | Number of hybrid vehicles<br>Reduction in fuel use |

### 16. Car Sharing

Increase participation in the County's car-sharing membership.

**Supporting Actions:**

- Provide incentives and management support to facilitate use of carsharing by all departments as an option to reduce the size of the County-owned vehicle fleet.
- Work with car-sharing companies to expand the availability of car-sharing vehicles throughout the county.

**Sustainability in Practice:**

In 2010, the County became a member of the local car-sharing company, FunRide. Membership in this program allows County employees to utilize alternative-fuel and fuel-efficient vehicles for work-related business when County fleet vehicles are not available. Increased participation in this program over time may allow the County to reduce the size of the vehicle fleet while providing greater flexibility to employees on the type of vehicle used for County business.

**Relevant COSE Policies:** AQ 2.3

**Implementation:**

| **Responsible Department:** | **All Departments** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Medium |
| County Savings: | Low |
| Performance Indicators: | Number of participants in car-share membership<br>Annual VMT in car-share vehicles<br>VMT/fleet size of County vehicles |



**Emissions Reductions**

2010:

-2 $MTCO_2e/yr$

2020:

-60 $MTCO_2e/yr$

2035:

-110 $MTCO_2e/yr$

**Co-Benefits**





**Emissions Reductions**

2020:

-3 $MTCO_2e/yr$

2035:

-20 $MTCO_2e/yr$

**Co-Benefits**

### 17. Alternative Fuels

Explore the use of alternative fuels in County vehicles and support the development of alternative fueling stations in the county through participation in the Central Coast Clean Cities Coalition (C5).

**Supporting Actions:**

- Develop additional fueling and storage facilities for the County's vehicle fleet.

**Sustainability in Practice:**

The County is a current member of the Central Coast Clean Cities Coalition, an organization committed to expanding the use and availability of clean and alternative-fuel vehicles. The County will continue to participate in this program and will evaluate options for converting portions of the County fleet from conventional fossil fuels to cleaner alternative fuels as their availability continues to grow.

**Relevant COSE Policies:** AQ 2.3, AQ 2.5

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Long-Term |
| County Costs: | Low-Mid |
| County Savings: | Low |
| Performance Indicators: | Number of alternative-fuel vehicles |

## EMPLOYEE COMMUTE

**GOAL: PROVIDE ADDITIONAL OPPORTUNITIES FOR EMPLOYEES TO UTILIZE ALTERNATIVE TRANSPORTATION OPTIONS AND REDUCE COMMUTE LENGTHS.**



### 18. New Facility Location

Take into consideration facility location, proximity to other facilities, access to transit, and ability to provide bike storage facilities when constructing or leasing new facilities.

**Supporting Actions:**

- Locate facilities within a ½ mile of transit stops or centers.
- Include bicycle commuter facilities, including bike storage, lockers, and showers, at all new and remodeled facilities.

**Sustainability in Practice:**

Development of South and North County Government Centers will not only decrease vehicle miles traveled (VMT) for the community traveling to County offices but also for employees who currently must travel from their residences to more central locations. Additionally, the development of County regional centers within existing communities will expand employee opportunities to utilize transit or bike or walk to work. This measure ensures that new and remodeled buildings will provide bicycle commuter facilities and bike parking.

**Relevant COSE Policies:** AQ 2.1, AQ 1.7

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Long-Term |
| County Costs: | Low |
| County Savings: | n/a |
| Performance Indicators: | Number of new facilities within a ½ mile of transit<br>Employee commute mode share |

**Emissions Reductions**

2020:

-290 $MTCO_2e/yr$

2035:

-510 $MTCO_2e/yr$

**Co-Benefits**





**Emissions Reductions**

2010:

-50 $MTCO_2e/yr$

2020:

-80 $MTCO_2e/yr$

2035:

-150 $MTCO_2e/yr$

**Co-Benefits**





### 19. Rideshare Participation

Increase participation in Rideshare commuter programs.

**Supporting Actions:**

- Provide targeted outreach to departments with less than 25% participation in Rideshare programs.
- Encourage additional participation in Rideshare's Bike Month and Commute for Cash Challenges.
- Work with Rideshare to conduct an annual employee commute survey.

**Sustainability in Practice:**

The County is one of the top employers in San Luis Obispo County; employee commuting contributes both County and community-wide GHG emissions. The County will continue to participate in the SLO Regional Rideshare program by offering incentives to employees who utilize alternatives modes like carpooling, biking, walking, or transit to get to and from work.

**Relevant COSE Policies:** AQ 2.1

**Implementation:**

| **Responsible Department:** | **All Departments** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low |
| County Savings: | n/a |
| Performance Indicators: | Participation in SLO Regional Rideshare programs |

### 20. Alternative Work Schedules

Standardize County telecommuting and alternative work schedule policies among departments to facilitate participation as appropriate to job classifications.

**Sustainability in Practice:**

In 2010, the County Board of Supervisors adopted new telecommute and alternative work schedule policies in an effort to reduce employee commute emissions without compromising public services. The policies allow employees to work remotely or to work a compressed workweek, reducing the need for additional commuting trips.

**Relevant COSE Policies:** AQ 2.1

**Implementation:**

| **Responsible Department:** | **All Departments** |
|---|---|
| Implementation Time Frame: | Near-Term |
| County Costs: | Low |
| County Savings: | n/a |
| Performance Indicators: | Number of employees telecommuting<br>Number of employees utilizing alternative work schedules |

### 21. Parking Passes

Implement workplace parking pricing at County employment centers in Downtown San Luis Obispo. Charge employees wishing to utilize a parking space provided by the County a daily or monthly fee.

**Supporting Actions:**

- Utilize the funds collected from employee parking charges to fund alternative commute programs.



**Emissions Reductions**

2010:

-240 $MTCO_2e/yr$

2020:

-240 $MTCO_2e/yr$

2035:

-290 $MTCO_2e/yr$

**Co-Benefits**



**Emissions Reductions**

2020:

-40 $MTCO_2e/yr$

2035:

-40 $MTCO_2e/yr$

**Co-Benefits**



**Sustainability in Practice:**

Charging for parking that is currently provided for free to County employees has the potential to reduce VMT associated with employee commuting. By removing the subsidy currently provided to employees parking in County parking lots, the costs of driving will be more accurately reflected, making alternative mode choices a more attractive option. Additionally, charging for the use of these spaces will generate funding that can assist in implementing additional employee commute trip reduction programs.

**Relevant COSE Policies:** AQ 2.1

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Generates revenues |
| County Savings: | n/a |
| Performance Indicators: | Employee commute mode share |

## WATER CONSERVATION

**GOAL: REDUCE WATER USE IN COUNTY FACILITIES 20% BY 2020.**

### 22. Water Fixture Retrofits

Retrofit facilities with water-efficient fixtures.

**Supporting Actions:**

- Install timers and sensors on toilet and sink fixtures in all facilities.
- Replace inefficient water fixtures with efficient models that do not exceed 1.6 gallons per flush for toilets and 2.0 gallons per minute for showers.

**Sustainability in Practice:**

Implementing water fixture retrofits at County facilities will reduce County potable water use and has the potential to provide the County with significant cost savings.

**Relevant COSE Policies:** WR 4.3.3

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Low-Mid |
| County Savings: | Low-Mid |
| Performance Indicators: | Number of fixtures replaced |

### 23. Water-Efficient Landscape

Replace County-maintained turf landscapes (not including park recreational fields or areas) with water-efficient landscapes and demonstration gardens.



**Emissions Reductions**

2020:

Supporting Measure – Not Quantified

2035:

Supporting Measure – Not Quantified

**Co-Benefits**







**Emissions Reductions**

2010:

Supporting Measure – Not Quantified

2020:

Supporting Measure – Not Quantified

2035:

Supporting Measure – Not Quantified

**Co-Benefits**







**Supporting Actions:**

- Evaluate existing irrigation systems to identify leaks and replace irrigation heads with more efficient fixtures.
- Replace turf areas that are not used for recreation purposes with native species and drip irrigation systems.

**Sustainability in Practice:**

In recent years, the County's parks have achieved a 10% reduction in water use through the implementation of irrigation system efficiency upgrades to comply with the County Stormwater Pollution Prevention Plan. The County is also identifying existing turf landscapes that can be replaced with native landscaping. Native landscaping will reduce the amount of water needed and will serve as a demonstration garden for the community. The SLO Botanical Garden will soon be removing turf from the San Luis Obispo courthouse building and replacing the turf with a native landscape demonstration garden.

**Relevant COSE Policies:** WR 4.3.1, WR 4.3.3

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Mid-Term |
| County Costs: | Low-Mid |
| County Savings: | Low-Mid |
| Performance Indicators: | Acres of turf replaced with native landscape |

### 24. Golf Course Water Use

Continue to reduce water use on County golf courses through participation in the Audubon International Cooperative Sanctuary Program.

**Sustainability in Practice:**

In recent years, the County-operated golf courses have continued to improve the environmental sustainability of each facility through participation in the Audubon International Cooperative Sanctuary Program. Actions to reduce the environmental impact of the County's golf courses include:

- Reduced water use,
- Replacement of turf with native, water-efficient landscaping,
- Development of a composting program,
- Reuse of construction materials,
- Continued planting of native trees, and
- Reduced fertilizer and pesticide application.

**Implementation:**

| **Responsible Department:** | **General Services Agency** |
|---|---|
| Implementation Time Frame: | Ongoing |
| County Costs: | Low-Mid |
| County Savings: | Medium |
| Performance Indicators: | Reduction in water use at County golf courses |



**Emissions Reductions**

2010:

Supporting Measure – Not Quantified

2020:

Supporting Measure – Not Quantified

2035:

Supporting Measure – Not Quantified

**Co-Benefits**





### County Government Operations GHG Emissions Reduction Summary

To date, the County has already reduced GHG emissions by 515 $MTCO_2e$ from 2006 baseline emissions levels (Table 6-1). Continued implementation of both new and existing programs will ensure the County reaches the adopted reduction target of 15% below baseline levels by 2020 (Figure 6-1). To reach the reduction target, the County will need to reduce GHG emissions by a minimum of 1,800 $MTCO_2e$ (Figure 6-2).

## **Table 6-1.** GHG Emissions Reduction Summary by Goal

| | **2010 $MTCO_2e$/yr** | **2020 $MTCO_2e$/yr** | **2035 $MTCO_2e$/yr** |
|---|---|---|---|
| Energy Efficiency & Conservation | -90 | -820 | -1,360 |
| Renewable Energy | -120 | -700 | -820 |
| Waste Reduction | -10 | -140 | -270 |
| Vehicle Fleet | -5 | -120 | -240 |
| Employee Commute | -290 | -660 | -990 |
| Water Conservation | n/a | n/a | n/a |
| **Total Reductions** | **-515** | **-2,440** | **-3,680** |

**Figure 6-2.** 2020 GHG Emissions Reduction Summary by Goal

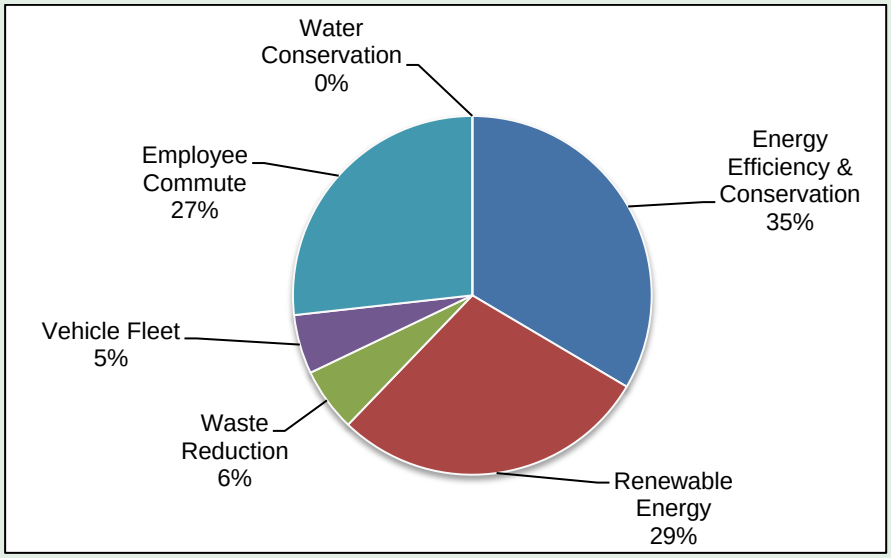
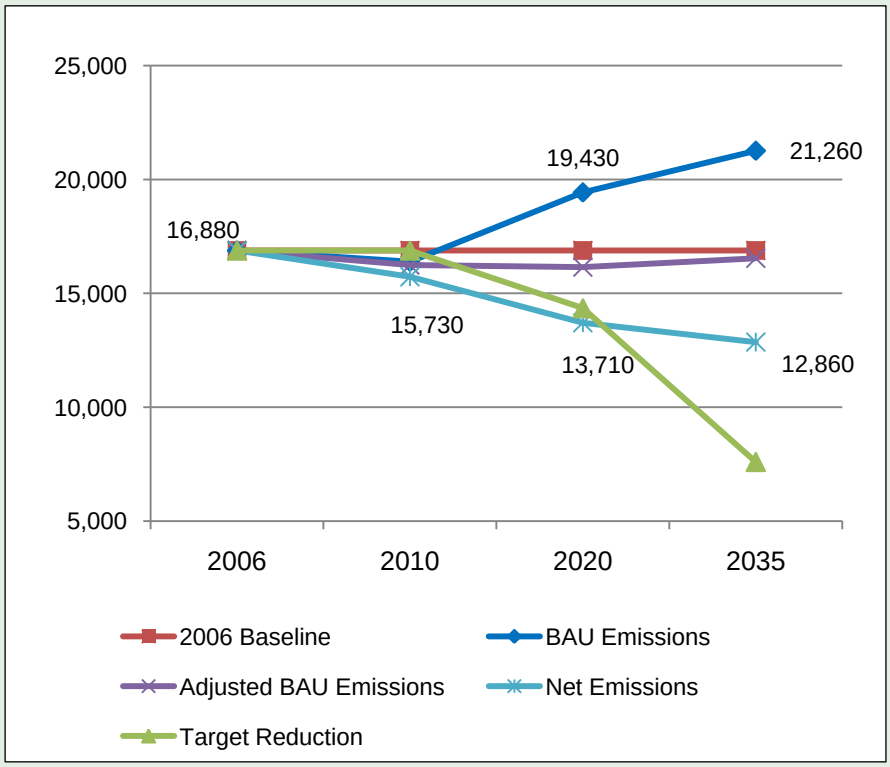



**Figure 6-3.** GHG Emissions Reduction Target Achievement





# 7 – ADAPTATION



# INTRODUCTION

The County anticipates that some degree of climate change will occur regardless of existing and future GHG reduction and mitigation efforts. As a result, we should understand the potential impacts of climate change and take steps to adapt to or manage potential changes to the local environment or socioeconomic system in an effort to reduce risks and increase resilience. Climate adaptation refers to the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007).

This chapter identifies adaptation measures that respond to the impacts of climate change in general and on:

- Public health
- Water supply
- Flooding and unpredictable weather
- Sea level rise
- Wildfire risks
- Agriculture
- Economy and tourism
- Natural systems

The following plans and programs represent some of the recent and/or ongoing activities that would complement an adaptation strategy.

- County General Plan, specifically the Conservation and Open Space Element and Safety Element
- Local Hazard Mitigation Plan

**Differences between adaptation strategies and mitigation measures**

The IPCC Fourth Assessment Report defines mitigation and adaptation as follows:

Mitigation (Reduction Measures) – Implementing policies to reduce greenhouse gas emissions and enhance sinks.

Adaptation – Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.

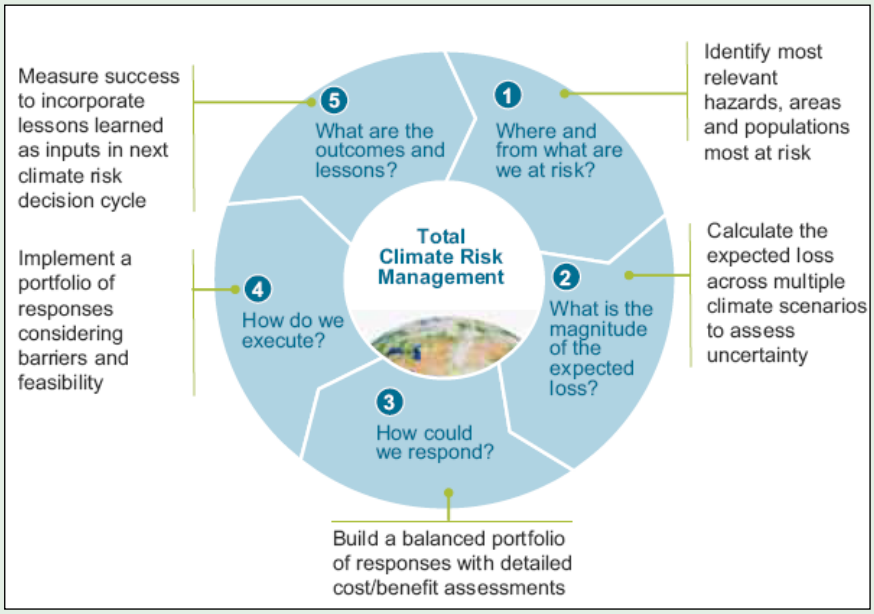


- Integrated Regional Water Management Plan
- Public Health/Environmental Health/Office of Emergency Services/APCD/Planning and Building regulations and requirements
- The Local Government Commission's Integrated Climate Change Adaptation Planning in San Luis Obispo County

Figure 7-1 illustrates that when preparing for climate change, a community must:

1) Identify impacts;
2) Determine magnitude of risks (potential cost of risks);
3) Determine actions (and cost of such actions);
4) Implement actions (with highest risks/lowest costs); and
5) Reassess and determine additional actions.

**Figure 7-1.** A Framework for Assessing and Addressing Total Climate Risk




Source: Economics of Climate Adaptation Working Group. 2009. Shaping Climate Resilient Development: A Framework for Decision Making.

The County has identified climate change impacts that are likely to occur and actions to address those impacts. However, the measures in this Plan should be considered a starting point to adapt to climate change. To more fully adapt to climate change, the County will support research and technical assessments to fully develop a comprehensive countywide adaptation strategy.

# CLIMATE CHANGE PROJECTIONS AND IMPACTS TO SAN LUIS OBISPO COUNTY

In 2009, the GEOS Institute[1] and the Local Government Commission received funding to evaluate climate change and adaptation in San Luis Obispo County. The project included an assessment of local climate change projections and culminated with the release of two reports. The first report, Projected Future Climatic and Ecological Conditions in San Luis Obispo County,[2] utilized climate modeling software to develop climate change projections specific to SLO County. The second report, Integrated Climate Change Adaptation Planning in San Luis Obispo County,[3] identified mitigation and adaptation strategies to limit the effect that climate change may have on San Luis Obispo's economy, natural systems, and the local population's quality of life.

## SLO County Climate Change Projections

The following projections were provided in the first report prepared by the GEOS Institute and the Local Government Commission, Projected Future Climatic and Ecological Conditions in San Luis Obispo County:

**Temperature** – Annual average temperatures across SLO County are expected to increase between 2.1 and 3.9 degrees Fahrenheit by 2045 and between 4.1 to 7.6 degrees Fahrenheit by 2085 (Figure 7-2).

[1] Formerly known as National Center for Conservation Science and Policy.

[2] Koopman, Nauman, and Leonard 2010.

[3] Koopman, Meis, and Corbett 2010.



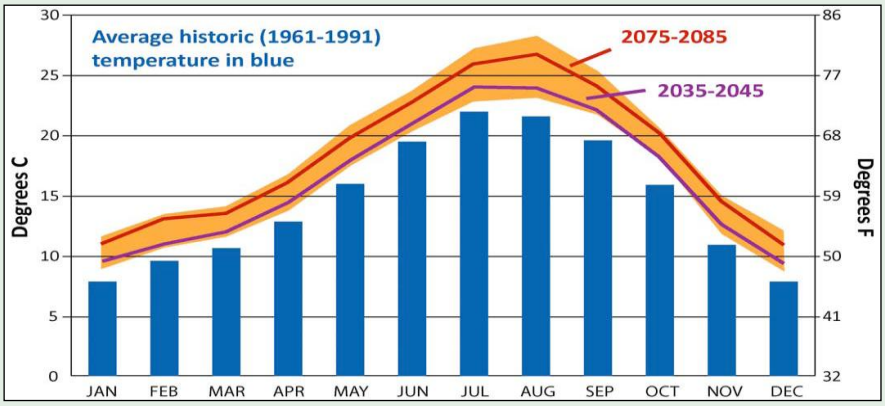
**Climate change's threat to agriculture**

Extreme events, such as heat waves, floods, and droughts, may be among the most challenging impacts of climate change for agriculture since they can lead to large losses in crop yields and livestock productivity. Since California plays a critical role in feeding not only state residents, but those of the U.S. and other countries, these large production declines and losses would translate to not only food shortages but financial and economic shifts that could disrupt local, regional, and national commodities systems.

(California Natural Resources Agency 2009)



**Figure 7-2.** Projected SLO County Average Temperatures[4]



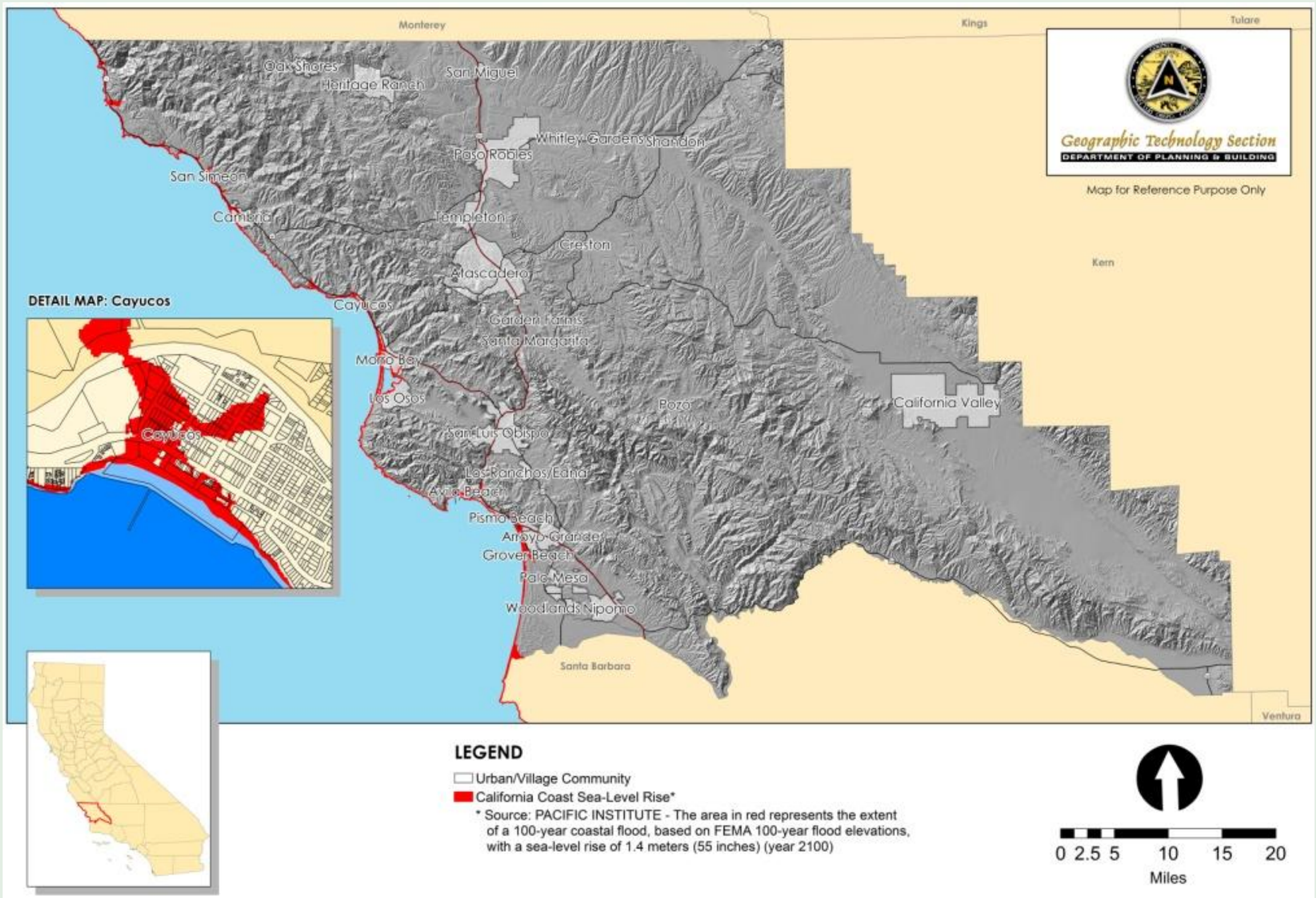

Source: Koopman, Marni, Richard Nauman, and Jessica Leonard. 2010. Projected Future Climatic and Ecological Conditions in San Luis Obispo County.

**Precipitation** – Climate model projections for future precipitation patterns in SLO County vary in predicting a moderate decrease or slight increase in annual precipitation. Annual average precipitation in SLO County is expected to decrease up to 4.2 inches or increase up to 1.5 inches by 2045 and decrease by 4.73 inches or increase by .88 inches by 2085. Even if levels of precipitation were to increase, soil moisture is expected to decline due to higher temperatures and evaporation.

**Sea Level Rise** – Over the last century, California has observed a nearly 8-inch rise in sea levels along the coast. Climate models have projected an additional 3.3 to 4.6 feet in sea level rise by 2100. Areas in San Luis Obispo County most at risk for sea level rise include Cayucos, Morro Strand State Beach, Avila Beach/Port San Luis Harbor, the Pismo Dunes/Oceano area, and San Simeon State Beach.

[4] Koopman, Nauman, and Leonard 2010.

**Figure 7-3.** Sea Level Rise





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## SLO County Climate Change Impacts

As noted in the report, Projected Future Climatic and Ecological Conditions in San Luis Obispo County, potential consequences of climate change include:

**Increased Rate of Wildfires** – Changes in vegetation patterns within the county due to higher temperatures and changes in precipitation are likely to cause an increased risk of wildfires. Annual changes in the area of the county burned by wildfire are expected to increase from 3.7% to 6.8–7.3% by 2045 and to 8.1–8.5% by 2085. The projected increase in frequency and size of wildfires in San Luis Obispo County has the potential to significantly increase demand on local emergency services and water supply while negatively impacting the county's air quality, native ecosystems, and land productivity.

**Negative Impacts on Wildlife** – The increased threat of wildfire combined with reduced water supply and rising sea levels have the potential to significantly alter natural ecosystems and wildlife habitats. Wildfire and flooding events may interrupt or segment wildlife migration patterns and corridors. As climate change progresses, fish, wildlife, and plants may respond by shifting species distributions (potentially moving northward or upslope) in an effort to track suitable climate conditions.

**Negative Impacts on Agricultural Productivity** – Agriculture and agricultural-related tourism are two of the region's most significant economic industries. Higher temperatures, decrease in water supply, and shifts in seasonal changes have the potential to negatively affect agricultural productivity, resulting in a loss of food security and decrease in agricultural-related tourism. Wine grapes are San Luis Obispo County's top ranking crop in economic value.[5] The quality of wine grapes is highly dependent on certain climatic conditions, especially temperatures. Moderate changes in temperature may potentially increase the quantity of wine grapes

**Vulnerable Populations**

There are three primary segments of vulnerable populations: those at risk to adverse climate change impacts due to exposure, sensitivity, or adaptive capacity.

**Exposure:** Physical conditions may put particular populations at risk to the impacts of climate change. For instance, populations living in low-lying or coastal areas may be more exposed to flooding events and sea level rise, while those who work outside may suffer from health-related issues due to increased temperatures and decreased air quality.

[5] County of San Luis Obispo Department of Agriculture/Weights and Measures 2009.



**Vulnerable Populations continued...**

**Sensitivity:** Certain populations, including young children and those over the age of 65, are physiologically more sensitive to extreme temperatures and increased instances of air pollution.

**Adaptive Capacity:** The adaptive capacity of lower-income and institutionalized populations can be limited due to lower access to the resources necessary to prepare for or react to the long-term impacts of climate change and the increased frequency of disasters.

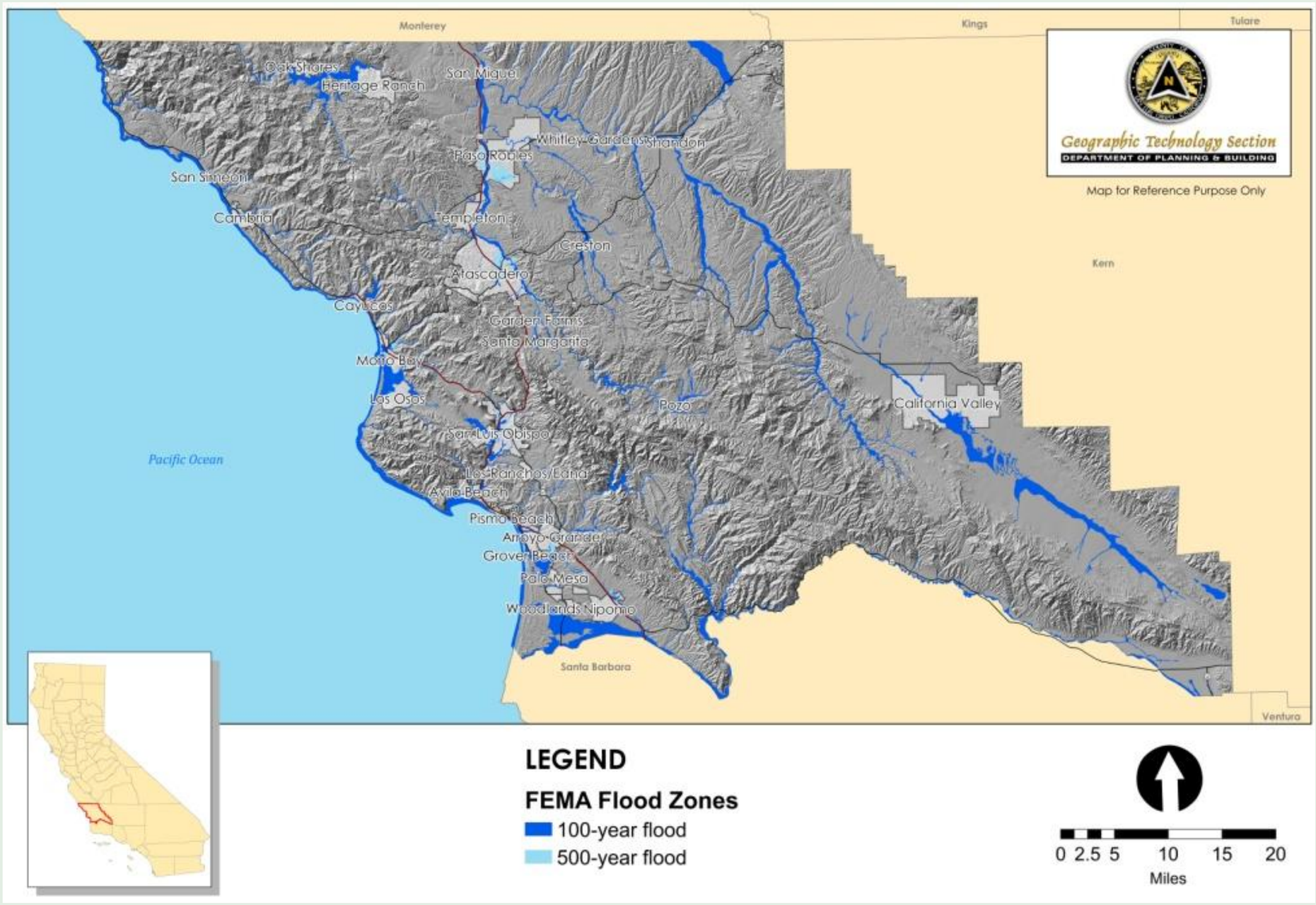
produced. However, seasonal temperature changes may negatively impact the quality of the wine grapes produced and limit the production of certain grape varieties.

**Deteriorating Public Health** – Public health in San Luis Obispo County may be substantially impacted by a variety of environmental conditions due to climate change. For example, changes in temperature and rainfall will decrease water supplies and increase the risk of wildfires, which have a detrimental effect on local air quality. Increased average temperatures combined with unpredictable weather occurrences can result in more extreme heat and cooling events, and unless actions are taken to protect the county's population, increased mortality and asthma-related admissions to local hospitals may occur.

**Decreased Supply of Fresh Water** – Higher temperatures and continued population growth suggest that there will be a growing demand for water while local groundwater and reservoir supplies are shrinking. Increased temperatures in San Luis Obispo County will continue to expose inland populations to more frequent heat days, and a decrease in coastal fog will also significantly increase the temperatures of coastal communities, resulting in increased electricity and water use.

**Increased Severity of Flood Events** – While climate model projections indicate that total annual rainfall may decrease or slightly increase, rainfall events are likely to occur less frequently but with greater severity. These rainfall events will pose additional challenges to manage runoff, sedimentation, soil water retention, and water storage. The combination of wildfire events followed by large amounts of rainfall can cause severe soil erosion, sedimentation runoff, and mudslides or landslides.

**Figure 7-4.** Flood Zone Map





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Several areas in San Luis Obispo County have been determined by the Federal Emergency Management Agency (FEMA) to fall within 500- and 100-year floodplains.[6] Areas within the floodplains will likely be more vulnerable to the heightened flooding threats that are anticipated to result from climate change. Localized flooding of low-lying areas will continue to be a concern as rainfall events become more severe.

**Rising Sea Levels** – Sea level rise is attributed to the increase of ocean temperatures and the resulting thermal expansion and melting of ice sheets, which contribute to the volume of water held in the oceans. The speed and amount of sea level rise will be determined by the increase in average temperatures and rate of melting of glacial ice. While there is a degree of uncertainty in the magnitude of projections, to date, the actual impacts of climate change have been more severe than the projections. With nearly 100 miles of coastline in San Luis Obispo County, sea level rise is likely to have the following effects:

- Increased erosion of coastal bluffs and risk of additional cliff failures;
- Higher storm surges and coastal flooding, making transportation and local infrastructure vulnerable to inundation during storms;
- Increased infrastructure and maintenance costs to protect local harbors and ports from storm surges and sea level rise;
- Loss of coastal wetlands due to permanent inundation;
- Saltwater intrusion into coastal freshwater supplies that serve local residents and agricultural uses.

[6] San Luis Obispo County 1999.



These impacts have the potential to negatively affect natural coastal ecosystems and the tourism and marine industries that rely on these ecosystems and land areas for economic productivity.

The years of 1995–2005 had the warmest global temperature ever recorded since record keeping began in 1850.[7] Higher temperatures will cause more rainfall than snowfall, which will impact water supplies not only for SLO County but for every other user of water in the state. Combined with longer summer seasons, the increased temperature will reduce soil moisture levels, increase irrigation, increase the need for air conditioning use, increase the rate and spread of wildfires, and stress the electrical infrastructure that serves the county. Increased flooding due to more intense and less predictable storms, along with sea level rise, will require proactive efforts in order to reduce the potential for damaging coastal flooding and erosion.

### How are adaptation measures different from reduction measures?

Adaptation and reduction measures are closely tied, but differ in that adaptation measures address the *effects* of climate change, whereas reduction or mitigation measures address the *cause.* The adaptation measures in this chapter are presented in a different format than the reduction measures in Chapters 5 and 6, as the adaptation measures have not been quantified for their greenhouse gas (GHG), energy, or economic benefits.

There are two types of adaptation measures: operational changes and increases to adaptive capacity. Operational measures assess climate change vulnerabilities and sensitive populations on a regular basis. They also address climate change adaptation in planning and public safety documents. Adaptive capacity measures are strategies that help prepare for and adjust to the impacts of climate change. Examples include the establishment of cooling centers during heat waves, promotion of energy efficiency and renewable energy to reduce peak load demand, and

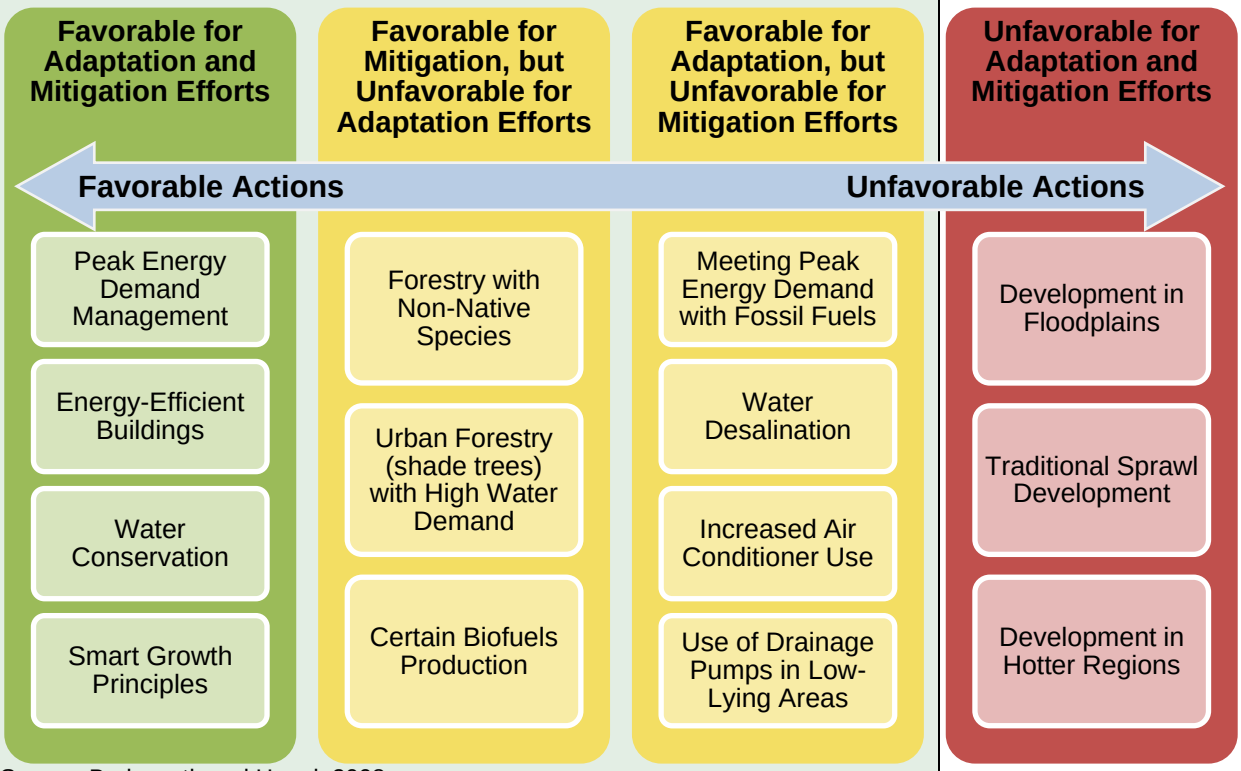
[7] Rosenweig et al. 2007.



implementation of low impact development standards to reduce stormwater runoff and increase groundwater recharge. While adaptation measures and reduction/mitigation measures may differ significantly in their goals, there can be significant common ground between them. For instance, a mitigation measure to plant native trees reduces GHG by sequestering carbon and can lower energy consumption for air conditioning. Native tree planting also helps to adapt to climate change impacts by reducing the urban heat island effect and increasing storm water infiltration. Figure 7-5 presents a spectrum of complementary and conflicting adaptation and mitigation (or GHG reduction) actions.

It should be noted that not all adaptation measures are reduction measures, and vice versa. This Plan incorporates adaptation measures that are not harmful to or in conflict with proposed GHG reduction or mitigation efforts at this time.

**Figure 7-5.** Complementary and Conflicting Adaptation and Mitigation Actions




Source: Bedsworth and Hanak 2008



# EXISTING ADAPTATION EFFORTS

The County has implemented many programs that serve as a foundation for climate change adaptation. Examples of such programs are Strategic Growth initiatives, integrated regional and water supply and management planning, water conservation strategies, energy conservation and alternative energy development, habitat management and conservation, and stormwater management with an emphasis on green infrastructure.

While climate change will not create new types of disasters in SLO County, it may instead make existing problems that already occur, either periodically or chronically, more severe or more frequent. While many of the County's existing disaster and emergency preparedness policies and programs are already in place to address disasters like flooding or wildfires, the intent of incorporating these existing policies and programs into the EnergyWise Plan is to identify that these policies either will support climate change adaptation efforts or may require additional attention. For example, consider the policy, "Coordinate between local, regional, state, and federal agencies before disasters occur to educate and organize people to respond appropriately to disasters and ensure there are few or no bureaucratic obstacles to performing emergency operations." This is something that the County already does through the Office of Emergency Services. However, the intent of including this policy in the EnergyWise Plan is to utilize climate change projections to ensure that the public and all necessary agencies are prepared, coordinated, and have the resources to respond to more frequent or larger disasters.

The County's existing efforts to prepare for the effects of climate change include the following policies and measures:

### Climate Change Projections and Impacts

1) Continue to work with climate change experts, and utilize available tools such as CalAdapt, to identify local climate change impacts to inform public policy decisions and to incorporate climate change adaptation measures into



planning documents. (*SLO COSE AQ 5.2.2, Safety Element Policy S-4*)

2) Coordinate between local, regional, state, and federal agencies before disasters occur to educate and organize people to respond appropriately to disasters and ensure there are few or no bureaucratic obstacles to performing emergency operations. (*Safety Element Program S-2, S-3, LGC Adaptation Measure Public Health and Emergency Preparedness*)

3) Activate the County Emergency Operations Plan during climate change induced emergencies or natural disasters.

4) Educate County residents on what to do during disasters or climate change related emergencies.

5) Coordinate between appropriate local, regional, state, and federal agencies during disasters to respond to risks and minimize damage or loss of life.

6) Continue to train, certify, and engage Community Emergency Response Teams (CERT) in emergency response operations.

7) Ensure quick recovery following severe events through the declaration of a federal and/or state disaster zone, waiving building permit fees for structures damaged or lost, or providing assistance to impacted economies.

**Public Health**

8) Maintain public health procedures and regulations for the identification, investigation, and containment of suspected diseases and conditions that may become more prevalent with a warming climate. (Local Hazard Mitigation Plan, *LHMP*)

9) Continue to work with the Air Pollution Control District to improve local air quality and minimize air pollutants that negatively affect public health.



10) Encourage energy conservation through energy efficiency retrofits, conservation behaviors, and distributed renewable energy to reduce pressure on the electrical grid during heat waves.

### Water Supply

11) Continue to coordinate with water suppliers to encourage water conservation, reuse water, and develop additional water supply sources. *(SLO COSE WR 1.1)*

12) Establish partnerships with local water suppliers (cities, CSDs) to develop a comprehensive water conservation program.

13) Prepare a region-wide Master Water Plan that will:

- Analyze supply and demand by evaluating the potential for new supplies;
- Investigate whether drought contingency plans or other emergency supplies are available to water purveyors.

### Flooding and Unpredictable Weather

14) Enforce flood hazard regulations by maintaining standards for the development and placement of structures in areas with poor drainage or prone to flooding. *(LHMP)*

15) Identify areas suitable for floodplain corridor easements to maintain agricultural production that is compatible with flood conveyance and protects urban areas from flooding.

### Sea Level Rise

16) Protect areas that are directly upland from dunes, coastal marshes, and wetlands to account for shifts in habitat due to sea level rise. *(LGC Coastal and Marine Resources and Related Tourism)*



17) Implement proactive and cost-effective measures to protect coastal infrastructure from damage due to coastal erosion, storm surges, landslides, and other hazards caused by sea level rise.

### Wildfire Risks

18) Reduce the risk of catastrophic wildfires through controlled burns, fuel reduction programs, improved fire access and defensible space, and the increased resiliency of buildings and structures in high fire hazard areas, as identified in **Figure 7-6**.*(Safety Element S-14, S-34)*

19) Support prescribed burning programs and minimize any air quality impacts that may occur. *(SLO COSE AQ 3.1.3, BR 2.7)*

20) Utilize fire-resistant building materials in the construction of new buildings. *(Safety Element S-32, LHMP)*

21) Implement Strategic Growth Principles to direct most new development into existing communities, avoiding high-risk wildfire areas.

### Agriculture

22) Assist farmers to implement conservation practices in their agricultural operations.

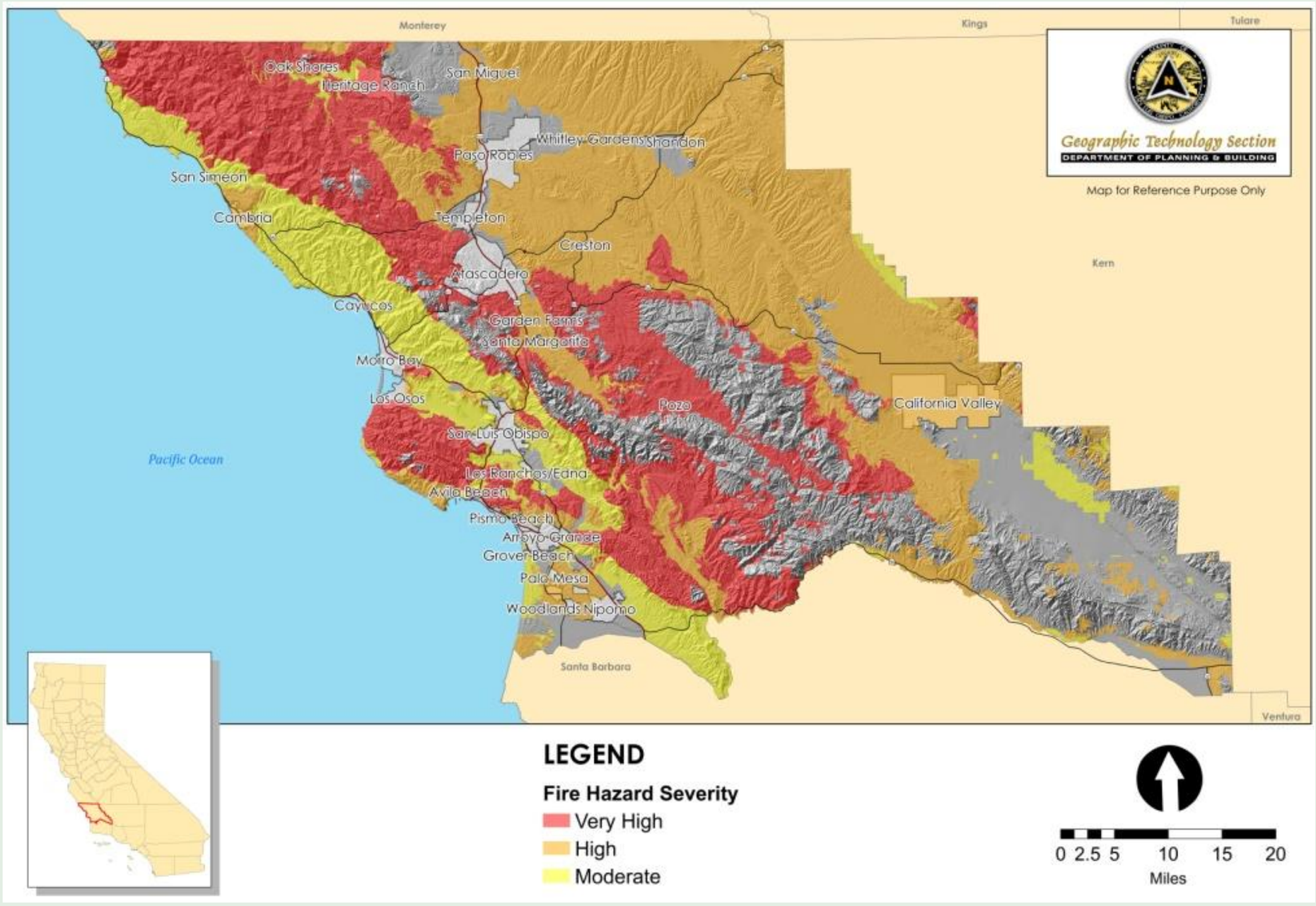
### Natural Systems

23) Implement Strategic Growth Principles and direct most new growth into existing communities to protect natural ecosystems and wildlife corridors.



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**Figure 7-6.** Fire Hazards Map





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# NEW ADAPTATION MEASURES

The following adaptation measures are organized according to the type of climate change impacts that they address. The County has developed goals (see Table 7-1) for addressing each potential climate change impact. Within each impact area, measures are organized by the time frame during which that measure is expected to be carried out, as follows:

| Implementation Time Frame | |
|---|---|
| Ongoing | Continual Implementation |
| Near Term | 0–10 years |
| Mid Term | 10–20 years |
| Long Term | 20+ years |

**Table 7-1.** Adaptation Goal Summary

| Potential Impact | Goal |
|---|---|
| Climate Change Impacts | Identify, assess, and prepare for climate change impacts in the county. |
| Public Health | Minimize potential risks from climate-related events that may compromise public health. |
| Water Supply | Ensure a secure, reliable, and safe water supply for county residents, agriculturists, businesses, and the environment. |
| Flooding and Unpredictable Weather Events | Reduce potential vulnerability to and impacts of extreme weather events. |
| Sea Level Rise | Identify and minimize risks of local sea level rise. |
| Wildfire Risks | Reduce the risk of catastrophic wildfires. |
| Agriculture | Ensure resiliency of the county's agriculture sector. |
| Economy and Tourism | Minimize the county's vulnerability to the economic impacts of climate change. |
| Natural Systems | Protect, restore, and improve local and regional ecosystems, habitats, and wildlife corridors. |



## CLIMATE CHANGE IMPACTS

### GOAL: IDENTIFY, ASSESS, AND PREPARE FOR CLIMATE CHANGE IMPACTS IN THE COUNTY.

Best practices direct local governments to coordinate and integrate short-, medium-, and long-term policy, infrastructure, and programmatic decisions across sectors as part of a comprehensive climate change adaptation strategy. In order to effectively adapt to the impacts of climate change, the County will need to continue to identify potential impacts through research, projections, and observations and implement policies to reduce these impacts. This adaptation strategy is the starting point for the County's coordinated efforts on adapting to the impacts of climate change.

**Ongoing Measures:**

1) Implement cost-effective policies and programs to mitigate greenhouse gas emissions and reduce the magnitude of climate change impacts.

2) Implement cost-effective policies and programs to adapt to the unavoidable impacts of climate change.

3) Update the County Emergency Operations Plan and contingency plans to comply with the State Emergency Plan.

**Near-Term Measures:**

4) Prepare a formal vulnerability assessment for the unincorporated county.

5) Identify potential barriers to climate change adaptation including funding, uncertainty, and the cooperation and coordination of agencies.

6) Engage the public in evaluating potential responses for adapting to climate impacts and risks.

7) Identify funding needs and potential sources of funding to implement climate adaptation programs and policies.



8) Incorporate potential climate change impacts into the decision-making process when siting new facilities and prioritizing repairs and improvements to critical infrastructure. *(LGC Adaptation Measure Public Health and Emergency Preparedness)*

**Mid-Term Measures:**

9) Coordinate an integrated update to the County's Local Hazard Mitigation Plan, the Safety Element of the General Plan, and other relevant plans to analyze the potential effects of climate change and develop policies, programs, and strategies to minimize risks to life, property, and natural systems. *(Safety Element Program S-2, S-3, LGC Adaptation Measure Public Health and Emergency Preparedness)*

10) Prepare and implement a program to educate county residents and businesses about potential climate change risks and identify the key steps individuals can undertake to prepare for potential climate change risks. *(LGC Adaptation Measure Public Health and Emergency Preparedness)*

**Long-Term Measures:**

11) Address reoccurring risks through continued research, updates to local plans and policies, and additional preparation and coordination (rebuilding in floodplains, coastal bluff erosion, air quality impacts to sensitive receptors, transitioning economies, etc.).

## PUBLIC HEALTH

### GOAL: MINIMIZE POTENTIAL RISKS FROM CLIMATE-RELATED EVENTS THAT MAY COMPROMISE PUBLIC HEALTH. (SLO COSE AQ 3.5)

Public health in the county may be affected by a variety of environmental conditions due to climate change. For example, changes in temperature and rainfall may decrease water supplies and increase the risk of wildfires that have a detrimental effect on



local air quality. Increased average temperatures combined with unpredictable weather occurrences may result in more extreme heat and cooling events. Unless actions are taken to protect the county's population, increased mortality and asthma-related admissions to local hospitals may occur.

**Ongoing Measures:**

1) Mitigate the urban heat island effect through the planting of urban forests and the use of light-colored building and pavement materials. *(SLO COSE E 4.4.2)*

2) Encourage businesses and local and regional agencies to participate in PG&E's Demand Response Program to curtail facility energy use during times of peak demand.

**Near-Term Measures:**

3) Establish formal partnerships with local and regional health-oriented organizations such as HEAL-SLO, CCPN, local parks and recreation departments, YMCA, and state and local health agencies to identify health risks and conditions that may compromise the population's ability to adapt or withstand to health-related stressors. *(LGC Adaptation Measure Public Health and Emergency Preparedness)*

4) Identify specific populations or segments of the local population that may have limited capacity to adapt to certain health-related stressors such as heat waves or cold spells, disease or virus outbreaks, or poor air quality events.

**Mid-Term Measures:**

5) Identify potential costs and funding sources for protecting the population from increased public health risks.

6) Update the existing Countywide Emergency Energy Contingency Plan to meet peak electricity and natural gas needs of essential facilities within the county at all times. *(SLO COSE E 1.2.2)*



7) Update the SLO County Emergency Operations Plan to incorporate public health-related events or outbreaks and establish procedures to protect the population from exposure to outbreaks or events.

8) Advise and contact sensitive or vulnerable populations during public health-related events or risks.

9) Identify accessible and secure locations for public cooling centers during extreme heat events.

**Long-Term Measures:**

10) Update plans and procedures as necessary following outbreaks or events to minimize risk or damage from future events.




## WATER SUPPLY

### GOAL: ENSURE A SECURE, RELIABLE, AND SAFE WATER SUPPLY FOR COUNTY RESIDENTS, AGRICULTURISTS, BUSINESSES, AND THE ENVIRONMENT.

While increased temperatures in San Luis Obispo County may continue to expose inland populations to more frequent heat days, a decrease in coastal fog will also significantly increase the temperatures of coastal communities, resulting in increased electricity and water use. Higher temperatures and continued population growth suggest that there will be a growing demand for water while local groundwater and reservoir supplies are shrinking.

**Ongoing Measures:**

1) Promote conservation of groundwater and evaluate potential improvements to groundwater recharge practices to provide additional water storage in case of drought. *(SLO COSE WR 2, LGC Water Resources & Infrastructure)*

2) Create requirements to reduce indoor water use from existing residential and nonresidential buildings, in accordance with State Law SB 407.



3) Minimize water loss through maintenance and repair of water delivery infrastructure.

4) Diversify the county's water supply sources through expanded use of reclaimed water, encouragement of rainwater catchment and greywater systems, and development of additional water supply sources. *(SLO COSE WR 1.4, WR 4.6, WR 4.6.1)*

5) Implement mandatory water conservation measures for County-operated water systems during times of drought or compromised water supply.

6) Evaluate the effectiveness of water conservation measures and identify additional measures to meet water conservation goals or needs.

**Near-Term Measures:**

7) Develop a GIS application identifying major land uses and quantifying their water demands based on acreage, land use, and consumptive use statistics.

8) Institute tiered water rate structures to encourage water conservation for customers of County-operated water supplies.

9) Implement CALGreen new residential and nonresidential building standards to reduce indoor and outdoor potable water use.

**Mid-Term Measures:**

10) Identify new potential water supplies to meet the demand of a growing population (including additional capacity at reservoirs, recycled water, on-site greywater systems, and rainwater harvesting systems).



**Long-Term Measures:**

11) Evaluate a water demand and water efficiency monitoring program in coordination with the County Planning Department's Resource Management System to monitor municipal, industrial, agricultural, recreational, and environmental demand on an ongoing basis.

12) Identify any water deficiencies and recommend projects, policies, and programs to address those deficiencies. *(SLO COSE WR 1.1.1, WR 5.2, LGC Water Resources & Infrastructure*)

## FLOODING AND UNPREDICTABLE WEATHER

### GOAL: REDUCE POTENTIAL VULNERABILITY TO AND IMPACTS OF EXTREME WEATHER EVENTS.

While climate model projections indicate that total annual rainfall may decrease or slightly increase, rainfall events are likely to occur less frequently but with greater severity. These rainfall events may pose additional challenges to manage runoff, sedimentation, soil water retention, and water storage. The combination of wildfire events followed by high-intensity rainfall can cause severe soil erosion, sedimentation runoff, and mudslides or landslides.

Several areas in San Luis Obispo County have been determined by the Federal Emergency Management Agency (FEMA) to fall within 500- and 100-year floodplains.[8] Areas within the floodplains will likely be more vulnerable to the heightened flooding threats that are anticipated to result from climate change. Localized flooding of low-lying areas will continue to be a concern as rainfall events become more severe.

The years of 1995–2005 had the warmest global temperature ever recorded since records have been kept (1850).[9] Higher temperatures will cause more rainfall than snowfall, which may

[8] San Luis Obispo County 1999.

[9] Rosenweig et al. 2007.



impact water supplies not only for SLO County but for every other user of water in the state. Combined with longer summer seasons, the increased temperature may reduce soil moisture levels, increase irrigation, increase the need for air conditioning use, increase the rate and spread of wildfires, and stress the electrical infrastructure that serves the county. Increased flooding due to more intense and less predictable storms, along with sea level rise, will require proactive efforts in order to reduce the potential for damaging coastal flooding and erosion.

**Ongoing Measures:**

1) Implement low-impact development (LID) standards in new development to minimize stormwater runoff, reduce the risk of flooding, and increase groundwater recharge. *(SLO COSE WR 6, WR 6.2.2, WR 6.4, WR 6.4.1, 6.4.2)*

**Mid-Term Measures:**

2) Work with property owners in areas prone to flooding to improve drainage, and develop a public information and education program in these areas to inform residents of best practices and emergency procedures. *(SLO COSE WR 6.1, WR 6.7)*

**Long-Term Measures:**

3) Consider utilizing transfer of development rights incentives to discourage the rebuilding of structures damaged or destroyed due to flooding in high-risk areas.

## SEA LEVEL RISE

### GOAL: IDENTIFY AND MINIMIZE RISKS OF LOCAL SEA LEVEL RISE.

Rising sea levels are attributed to increasing ocean temperatures and the resulting thermal expansion and melting of snow and ice, which increases the volume of water held in the oceans. The speed and amount of sea level rise will be determined by the increase in average temperatures and rate of melting of glacial ice. While there



is a degree of uncertainty in the magnitude of projections, historical projections have been more conservative than the actual impacts of climate change once they occurred. With nearly 100 miles of coastline in San Luis Obispo County, sea level rise is likely to have the following effects on these areas:

- Increased erosion of coastal bluffs and risk of additional cliff failures;
- Higher storm surges and coastal flooding, making transportation and local infrastructure vulnerable to inundation during storms;
- Increased infrastructure and maintenance costs to protect local harbors and ports from storm surges and sea level rise;
- Loss of coastal wetlands due to permanent inundation;
- Saltwater intrusion into coastal freshwater supplies that serve local residents and agriculture uses.

**Near-Term Measures:**

1) Require all applications for new development of a beach, beachfront, or bluff-top property to account for projected sea level rise. *(CA Coastal Act)*

Mid Term Measures:

2) Reassess coastal land use policies and plans to reduce potential impacts associated with sea level rise and coastal erosion. *(LGC Coastal and Marine Resources and Related Tourism, LHMP, Safety Element S-23)*

3) Create a supporting scientific effort to translate sea level rise data into decision-relevant metrics such as coastal erosion rates; extent, frequency, and change in elevation of flood events; groundwater salinity changes; wetland inundation risks; etc. *(CA Pacific Council)*



4) Educate and train coastal planners, managers, and decision makers to increase their level of understanding of climate change science, potential impacts, on-the-ground vulnerabilities, and the techniques and tools of adaptation planning. *(CA Pacific Council*)

5) Work with the California Coastal Commission to identify and protect coastal access points that may be vulnerable to damage from sea level rise, coastal bluff erosion, or storm surges.

6) Collaborate with local, regional, and state transportation and infrastructure agencies to identify and evaluate the options to mitigate potential risks to coastal infrastructure such as roads, water and wastewater facilities, energy generation and distribution facilities, and erosion control or sea wall protection structures.

7) Update local coastal plans to incorporate information from the statewide coastal vulnerability assessments produced by the California Natural Resources Agency. *(CA Pacific Council)*

**Long-Term Measures:**

8) Monitor the impacts and identify potential threats of sea level rise on coastal communities. *(SLO COSE AQ 5.1.1)*

9) Encourage insurers and reinsurers to incorporate future climate impacts into risk assessment models used to determine homeowner and business insurance rates.

10) Assess existing transportation design standards and their adequacy to protect transportation facilities from sea level rise and extreme weather events. (*CCAS)*

11) Work with state and national insurance programs to protect development along coastlines and other high-risk areas.



## WILDFIRE RISKS

### GOAL: REDUCE THE RISK OF CATASTROPHIC WILDFIRES.

The projected increase in frequency and size of wildfires in San Luis Obispo County has the potential to significantly increase demand on local emergency services and water supply while negatively impacting the county's air quality, native ecosystems, and land productivity. Invasive species or disease resulting in increased fuel accumulation (dead plants/shrubs/trees) may increase the severity or spread of wildfires. Wildfires have a significant impact on air quality and/or public health.

Ongoing Measures:

1) Continue to update and re-evaluate fire risk maps to identify areas that may become a higher fire risk, including Cal Fire's Fire Hazard Severity Zone Mapping System for State responsibility areas.

2) Consider project alternatives that avoid new development in areas that cannot be adequately protected from wildfire risks.

3) Require new development in fire hazard areas to cluster buildings to allow for adequate wildfire protection zones and defensible space. *(LHMP, Safety Element S-30, S-31, S-33)*

4) Strengthen efforts to guide and invest in vegetation management to minimize future fire risks and avoid additional natural hazards such as landslides or mudslides.

## AGRICULTURE

### GOAL: ENSURE RESILIENCY OF THE COUNTY'S AGRICULTURE SECTOR.

Agriculture and agricultural-related tourism are two of the region's most significant industries. Higher temperatures, decrease in water supply, and shifts in seasonal patterns have the potential to negatively affect agricultural productivity, resulting in a loss of food security and decrease in agricultural-related tourism.

# ADAPTATION



Wine grapes are San Luis Obispo County's top ranking crop in economic value.[10] The quality of wine grapes is highly dependent on certain climatic conditions, especially temperatures. Moderate changes in temperature may potentially increase the quantity of wine grapes produced. However, seasonal temperature changes may negatively impact the quality of the wine grapes produced and limit the production of certain grape varieties. Increased temperatures may lead to the outbreak of existing diseases such as Pierce's Disease and powdery mildew or the outbreak of new diseases.

Developing crops, varieties, and traits that are resistant to pests and diseases will improve producers' ability to adapt to climate change.

**Near-Term Measures:**

1) Utilize GIS mapping systems to analyze the potential impacts of climate change on agricultural resources.

**Mid-Term Measures:**

2) Identify actions and responses to minimize the spread or invasion of new pests, diseases, or weeds that may be harmful to agricultural productivity.

3) Work with the UC Cooperative Extension and agricultural organizations to assist and educate farmers in adapting to the effects of climate change. Adaptation techniques may include changes in crop selection, patterns, and practices.

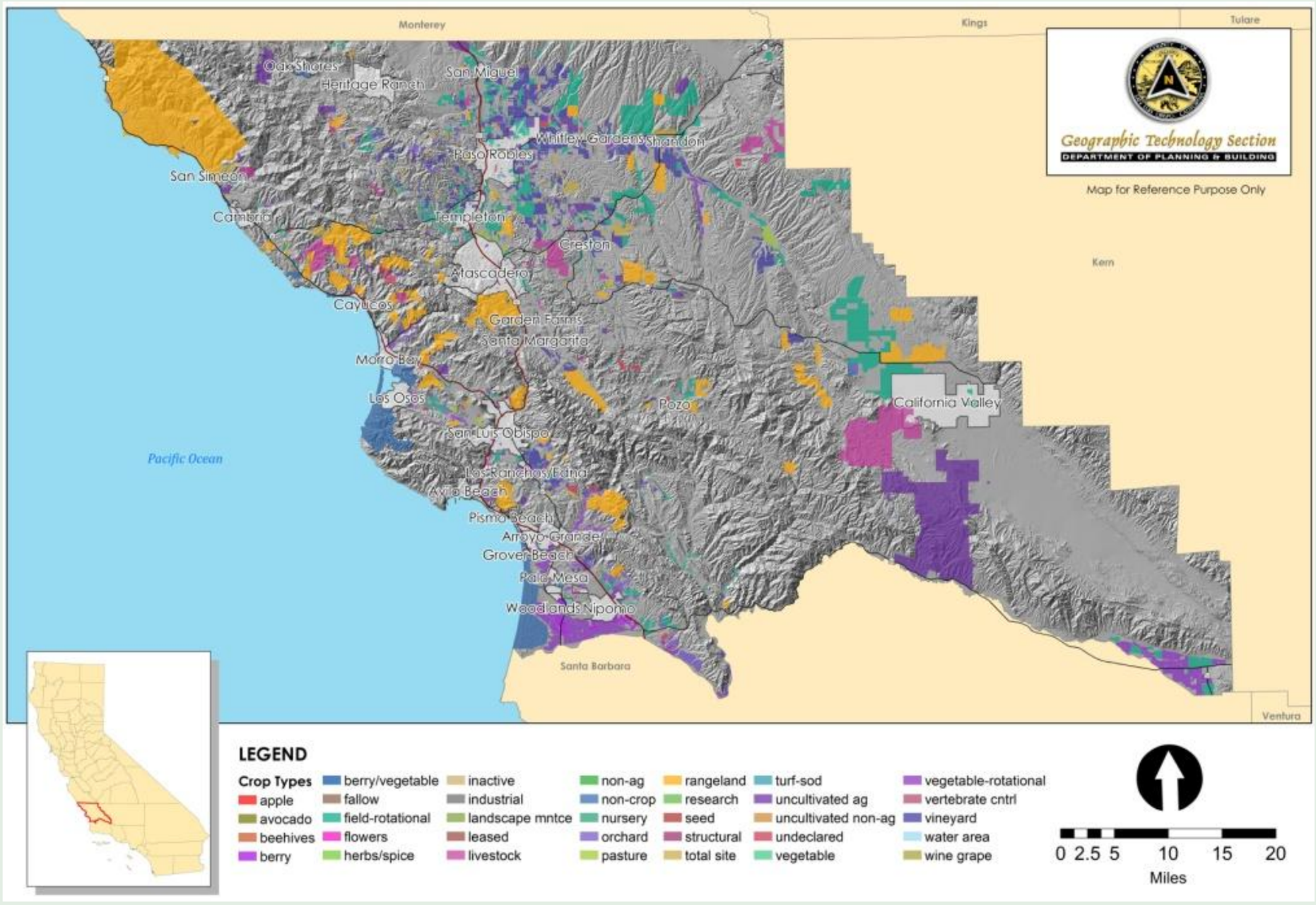
**Long-Term Measures:**

Work with agricultural providers, the UC Cooperative Extension, and researchers to identify crops that may be better fit to adapt to warmer growing seasons and more frequent freeze events. (a shift to greater crop diversity will offset some of the risks from weather variation and potential pest outbreaks due to climate change).

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[10] County of San Luis Obispo Department of Agriculture/Weights and Measures 2009.

**Figure 7-7.** Crops Map





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## ECONOMY AND TOURISM

### GOAL: MINIMIZE THE COUNTY'S VULNERABILITY TO THE ECONOMIC IMPACTS OF CLIMATE CHANGE.

Climate change has the potential to cause some economic sectors to decline and to stimulate growth of new and growing economic industries. Local impacts of climate change have the potential to negatively affect natural coastal ecosystems and, in turn, the tourism and marine industries that rely on these ecosystems and land areas for economic productivity. The following potential effects of climate change can negatively affect recreation and tourism, but can be addressed by preserving rare or vulnerable ecosystems:

- Declining fish populations (both freshwater and ocean)
- Shift in migratory bird routes (decline in birding)
- Loss of biodiversity in ocean (decline in both fishing and scuba)
- Primary route closures (landslides or sea level rise along Highway 1)

**Ongoing Measures:**

1) Develop and promote strategies to draw visitors in ways that boost local businesses, minimize impacts to natural resources, and build environmental awareness. (ecotourism)

2) Continue to develop and implement programs that expand local economic opportunities and prepare local economies to adapt to a changing climate. *(EVC Clusters of Economic Opportunities Report)*



## NATURAL SYSTEMS

### GOAL: PROTECT, RESTORE, AND IMPROVE LOCAL AND REGIONAL ECOSYSTEMS, HABITATS, AND WILDLIFE CORRIDORS.

The increased threat of wildfire combined with reduced water supply and rising sea levels have the potential to significantly alter natural ecosystems and wildlife habitats. Wildfire and flooding events may interrupt or segment wildlife migration patterns and corridors. Fish, wildlife, and plants may respond to increasing temperatures and other climate changes by shifting species distributions (potentially moving northward or upslope) in an effort to track suitable climate conditions.

**Ongoing Measures:**

1) Continue to monitor and research the potential impacts that climate change may have on local (oceanic, coastal, and inland valley) habitats and wildlife. *(SLO COSE BR 1.5.2)*

2) Protect wildlife habitats through improved land management practices to reduce sedimentation flows into creeks and other waterways. *(LGC Species, Ecosystems, and Ecosystem Services)*

**Mid-Term Measures:**

3) Identify and protect locations where native species may shift or lose habitat due to climate change impacts (sea level rise, loss of wetlands, warmer temperatures, drought).






# 8 – IMPLEMENTATION

# IMPLEMENTATION

CHAPTER 8




The County recognizes that a clear and practical implementation program is necessary to achieve our 2020 and 2035 goals and reduction targets. Overcoming climate change will require everyone—government agencies, businesses, nonprofit organizations, residents, and County staff—to work together to implement this Plan collaboratively with regional, state, and national activities.

This Implementation Program (Program) provides a strategy for action with specific measures and steps to achieve the identified reduction targets. The Program identifies responsible departments, potential costs to the County and community, cost savings, time frames for action, and the indicators that will be used to measure progress. The Implementation Program for community-wide measures notes the applicability of each measure to new or existing development and identifies the co-benefits that will occur in addition to reducing greenhouse gas (GHG) emissions.

These matrices allow staff, the Board of Supervisors, partner agencies, stakeholders, and interested parties to track measures of interest and to monitor progress. Each reduction measure is prepared with the best intentions; however, implementation requires oversight and political, organizational, and financial commitment. County costs, community costs, and community savings are presented as metrics for simplicity.

This chapter provides two essential tools for implementation: a designated goal and accompanying measures and actions specific to implementation and a detailed Implementation Program (refer to **Tables 8-2** and **8-3**).



# IMPLEMENTATION GOALS AND MEASURES

## IMPLEMENT THE ENERGYWISE PLAN

**GOAL: THE ENERGYWISE PLAN WILL BE IMPLEMENTED TO REDUCE GREENHOUSE GAS EMISSIONS FROM COMMUNITY-WIDE AND COUNTY OPERATIONS SOURCES BY A MINIMUM OF 15% FROM THE 2006 BASELINE EMISSIONS BY 2020.**

The following implementation measures accompany the emissions reduction measures presented in Chapters 5 and 6.

**Bi-Annually monitor and report the County's progress toward achieving the reduction target.**

**Supporting Action:**

- Provide support to the County's Green Team to facilitate implementation of measures and actions related to County operations.
- Prepare a bi-annual progress report for review and consideration by the Board of Supervisors. Consider integration of performance indicators into the Department of Planning and Building's Annual Resource Summary Report.
- Develop a monitoring and reporting tool to assist with annual reports.
- Identify key staff responsible for annual reporting and monitoring.

**Update the baseline greenhouse gas emissions inventory every five years.**

**Supporting Actions:**

- Initiate the 2010 baseline GHG inventory no later than 2013 (or at a time directed by the Board of Supervisors).




**Continue to develop partnerships that support implementation of the EnergyWise Plan.**

**Supporting Actions:**

- Continue formal memberships in local and regional organizations that provide tools and support for energy efficiency, energy conservation, greenhouse gas emissions reductions, adaptation, education, and implementation of this Plan.

**Maintain funding to implement the EnergyWise Plan.**

**Supporting Actions:**

- Identify funding sources for all reduction measures as part of bi-annual reporting.
- Ensure implementation through inclusion of emissions reduction and adaptation measures and actions implementation in department budgets, capital improvement programs, and other plans as appropriate.
- Pursue local, regional, state, and federal grants as appropriate to support implementation.

**Integrate climate action and energy efficiency planning with other activities and programs in the county.**

**Supporting Actions:**

- Integrate the EnergyWise measures and actions into the General Plan, the Capital Improvement Plan, and department work plans as appropriate.



**Review and update the EnergyWise Plan at least once prior to the year 2020.**

**Supporting Actions:**

- Review and update the plan as appropriate following the adoption of the County's Land Use and Circulation Element update.
- Update the plan as necessary to ensure progress toward the County's reduction target and to comply with state regulations.

# IMPLEMENTATION PROGRAM

### Implementation Program Users Guide

Details on Implementation Program metrics are listed below.

**Actions:** Supporting actions for each reduction measure.

**Implementation Time Frame:** The implementation time frame is an important consideration in quantifying the GHG reduction impact that each measure will have, as many measures will have a cumulative impact on GHG emissions and delayed implementation will reduce the effectiveness of each measure in helping to achieve the GHG reduction targets. The time frame indicated for each measure will assist with budgetary and decision-making processes and ensure that measures are implemented in a logical order and timely manner. **Table 8-1** provides the list of time frames applied to reduction measures.

## **Table 8-1.** Implementation Time Frames

| Numeric Time Frame | General Time Frame |
|---|---|
| Continual | Ongoing |
| This Year | Immediate |
| 1–5 Years | Near-Term |
| 5–10 Years | Mid-Term |
| 10+ Years | Long-Term |

**Table 8-2.** Implementation Program

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| **Goal: Address future energy needs through increased conservation and efficiency in all sectors.** | | | | | | | | | | |
| 1 | Energy Conservation Programs | Collaborate with local utility providers, educational institutions, and stakeholders to develop effective energy conservation campaigns through energy competitions and to provide targeted marketing for new and existing conservation programs. | • Work with local utility providers to develop a competition between the communities within SLO County to reduce total energy consumption over an extended period of time (6 months to 1 year).<br>• Continue to encourage and promote utility provider energy conservation programs for residential, commercial, industrial, agricultural, and governmental buildings.<br>• Develop and host a community web portal to streamline access to community and institutional sustainability websites.<br>• Continue to recognize and encourage conservation programs and educational outreach conducted by industry organizations, non-governmental entities, and government agencies. | -2,870 | 5% household participation and 1% business participation in energy competition program.<br>1% of population voluntarily conserve 10% of energy use.<br>5% of large commercial facilities retrocommissioned. | Low-Mid | Low | Medium | Near-Term | Planning and Building |
| 2 | Low-Income Weatherization | Promote existing low-income energy conservation and weatherization programs and coordinate with local utility providers and nonprofit corporations to develop additional energy efficiency programs. | • Continue to encourage investment in energy efficiency through Community Action Partnership (CAPSLO) and utility provider low-income weatherization programs.<br>• Support the Community Action Partnership's provision of free energy services to low-income households, including weatherization, furnace repair, and water heater replacement. | -1,120 | 75 households retrofitted annually<br>750 households retrofitted by 2020 | Minimal | Minimal | Low-Mid | Ongoing | Planning and Building |
| 3 | Energy Efficiency Financing | Develop and adopt an energy efficiency retrofit program to increase energy efficiency in existing commercial, residential, governmental, and industrial facilities. | • Develop an energy efficiency financing program (through PACE, Energy Upgrade California, or other mechanisms) allowing property owners to invest in energy efficiency upgrades for their buildings.<br>• Encourage and assist voluntary actions including financing programs, by owners of existing commercial and residential buildings for energy efficiency retrofits, such as the installation of solar panels, wind turbines, green roofs, cool roofs, natural lighting, and other long-term, permanent energy conservation installations. | -11,430 | 15% of households and 10% of businesses participating.<br>Average electricity savings of 10%.<br>Average natural gas savings of 25%. | Low-Mid | Medium | Medium-High | Mid-Term | Planning and Building |
| 4 | Energy Efficiency in Existing Buildings | The County will collaborate with the incorporated cities in the county to develop and implement a countywide program to: 1) conduct energy audits or provide EPA Home Energy Scores for residential buildings; 2) disclose energy use history of non-residential buildings; and 3) prepare an energy conservation ordinance to reduce electricity and natural gas use by implementing energy efficiency measures identified in the energy audits. | • Seek funding and financing options.<br>Explore options for energy audits conducted by the property owner, a certified building inspector, buyer or seller.<br>• Comply with State Law, AB 1103, to require all non-residential properties to provide buyers or tenants with the previous years' energy use by documenting use through the EPA's Energy Star Portfolio Manager or through some other mechanism.<br>• Allow in-lieu fees for new development to be utilized for retrofitting existing buildings with energy-efficient fixtures in lieu of energy efficiency measures for new buildings.<br>• Evaluate options for an energy conservation ordinance. For example, implement energy efficiency measures identified in energy audits: | -9,580 | 3,200 residential units audited and 16% of nonresidential properties audited.<br>20% average energy savings per residential building and 25% for nonresidential buildings. | Low | Medium-High | Medium-High | Near-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | By a date certain for residential and non-residential buildings; and/or<br>For major remodels or additions; and/or<br>For pre-1990 structures or structures in certain climate zones; or<br>At the time of sale. | | | | | | | |
| 5 | Workforce Training Programs | Continue to seek funding and support green building and weatherization training programs like the SLO County Workforce Investment Board's program funded by the California Clean Energy Workforce Training Program. | • Support existing workforce training programs.<br>• Continue to educate staff and the public about green building through partnerships with local nonprofit organizations (SLO Green Build), professional planning and building organizations (USGBC C4), and local agencies. | Supporting Measure – Not Quantifiable | 1,000 participants trained | Minimal | Minimal | Minimal | Ongoing | Planning and Building |
| 6 | Smart Grid Technology | Work with local utility providers to implement smart grid technology in new and existing residential and nonresidential properties. | • Encourage expedited installation of real-time energy monitoring (such as smart meters) for natural gas, electricity, and water meters on all residential and nonresidential buildings consistent with Board of Supervisors Resolution 2011-62.<br>• Work with the utility companies to develop a web-based application or install energy monitors to provide customers with real-time feedback on their energy consumption and related costs.<br>• Encourage building users to install smart grid integrated appliances that can be automated to run when electricity costs are lowest and controlled remotely through a web or phone application.<br>• Encourage the installation of energy monitors and smart grid appliances in new residential and nonresidential buildings as such appliances become commercially available and economically feasible. | -7,930 | 50% of homes and businesses utilizing energy monitors | Minimal | Minimal | High | Near-Term | Planning and Building |
| 7 | Energy-Efficient New Development | Encourage and incentivize new development projects to exceed minimum Cal Green requirements. | • Require the use of energy-efficient equipment in all new development, including but not limited to Energy Star appliances, high-energy efficiency equipment, heat recovery equipment, and building energy management systems.<br>• Amend community design plans, guidelines, and other documents to promote the following design techniques to maximize solar resources:<br>– Passive solar design, thermal mass, and insulation to reduce space heating and cooling needs;<br>– Shading on east, west, and south windows with overhangs, awnings, or deciduous trees; and<br>– Sustainable site design and landscaping to create comfortable microclimates.<br>• Encourage new projects to provide ample daylight within the structure through the use of lighting shelves, exterior fins, skylights, atriums, courtyards, or other features to enhance natural light penetration.<br>• Minimize the use of dark materials on roofs by requiring roofs to achieve a minimum solar reflectivity index (SRI) | -3,780 | Percentage of new and renovated buildings complying with the Green Building Ordinance | Low-Mid | Medium | Medium | Mid-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | of 10 for high-slope roofs and 64 for low-slope roofs (CALGreen 5.1 Planning and Design).<br>• Minimize heat gain from surface parking lots by utilizing the following strategies for a minimum of 50% of the site's hardscape:<br>– Provide shade from the existing tree canopy or within five years of landscape installation;<br>– Provide shade from structures covered by solar panels;<br>– Provide shade structures or hardscape materials with a minimum SRI of 29;<br>– Use an open-grid pavement system (at least 50% pervious).<br>• Use light-colored aggregate in new road construction and repaving projects adjacent to existing cities and in some of the communities north of the Cuesta Grade. | | | | | | | |
| 8 | Community Forestry Program | Pursue a comprehensive program to plant and maintain trees on County-maintained roads, medians, and public parking lots in the unincorporated communities. Expand the program to include tree planting on private property where owners wish to be part of the program. Encourage property owners to plant and maintain trees near structures to reduce building energy demand. | • Continue tree replacement and mitigation requirements when removing trees with new development.<br>• Work with County and other government agencies and unincorporated communities to identify public lands suitable for large- and small-scale planting programs.<br>• Continue to require the protection of native trees on land proposed for development.<br>• Form partnerships with local advocacy and community groups to fund the planting and maintenance of street trees.<br>• Partner with government agencies and nongovernmental organizations to provide expertise, maintenance, incentives and free/low-cost trees to urban and rural property owners and agriculturists.<br>• Participate in community greening projects in five unincorporated communities through grants and community plans.<br>• Establish a website to disseminate tree planting information, solicit donations, and educate the public regarding the multiple benefits of tree planting programs. | -790 | 6,500 new trees planted | Low | Low-Mid | Low-Mid | Ongoing | Planning and Building, Public Works |
| **Goal: Increase the production of renewable energy from small-scale and commercial-scale renewable energy installations to account for 10% of total local energy use by 2020.** | | | | | | | | | | |
| 9 | Countywide Energy Collaborative | Build a collaborative network or organizational structure to work with the seven cities, other local and state agencies, investor-owned utilities, the California Energy Commission, and the California Public Utilities Commission to promote a wide range of energy efficiency and renewable programs. | •Increase County participation and Energy Watch funding to localize existing programs such as commercial and residential direct install.<br>•Form a regional energy authority or other organizational structure that will include cities, the County, and state and local agencies.<br>•Evaluate a local "feed in tariff" for renewable energy distributed generation.<br>•Work with the utilities to establish other local energy-related programs such as public agency energy efficiency programs.<br>•Evaluate the development of a Community Choice Aggregation program with the incorporated cities in San Luis Obispo County to procure up to 50% of the region's electricity use from renewable resources by 2020. | 0 to -20,680 | 50% of electricity from renewable sources | High | Minimal | Minimal | Mid-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | •Establish a countywide energy office that will serve as a centralized location for energy efficiency and generation, energy financing, water conservation, green building and other sustainability programs. | | | | | | | |
| 10 | Commercial-Scale Renewable Energy | Develop a comprehensive renewable energy strategy to encourage the commercial-scale installation of renewable energy projects within the county. | • Complete the Renewable Energy Secure Community (RESCO) contract project by 2012.<br>• Use state, federal, or other available data to map areas that contain renewable energy resources by 2015.<br>• Designate and protect areas that contain renewable energy resources such as wind, solar, geothermal, and small hydroelectric.<br>• Continue participation in the Energy Watch Partnership.<br>• Amend the Land Use Ordinance to apply renewable energy overlay designations to areas identified in COSE Implementation Strategy E 6.8.1. | Included in the Renewable Portfolio Standard | Megawatts of solar installed | Minimal | Minimal | Minimal | Long-Term | Planning and Building |
| 11 | Small-Scale Renewable Energy | Implement a financing program to provide property owners with low-interest loans for the installation of renewable energy resources (refer to Measure 3). | • Revise County policies and regulations as needed to eliminate barriers to or unreasonable restrictions on the use of renewable energy.<br>• Designate and protect areas that contain potential small scale renewable energy resources such as wind, solar, geothermal, and small hydroelectric.<br>• Amend the Land Use Ordinance to apply small-scale renewable energy overlay designations to areas identified in the RESCO study. Also see COSE Implementation Strategy E 6.8.1 for commercial scale.<br>• Promote the development of sustainable energy sources and renewable energy projects through streamlined planning and development rules, codes, processing, and other incentives.<br>• Collaborate with stakeholder groups, including business and property owners, wineries, and other agricultural operations, to increase awareness of renewable energy systems, to streamline the permitting process, and to identify incentives.<br>• Assign a single point of contact within the County Planning and Building departments for energy efficiency and renewable energy project questions. | -19,850 | 28 MW of renewable energy systems installed | Low | High | High | Mid-Term | Planning and Building |
| 12 | Renewable Energy Partnerships | Collaborate with local and state governmental agencies (California Men's Colony, Cal Poly, Cuesta College, etc.) and energy facility operators to develop renewable energy sources at existing facilities. | • Work with PG&E, Cal Poly, and other organizations or businesses as appropriate to sponsor demonstration projects for community solar photovoltaic power, wind energy, and light-emitting diode (LED) lights for roads and parking lots.<br>• Seek funding and low-interest loan opportunities for local and state agencies to purchase and install renewable energy systems, with a goal of achieving 10% of total local and state agency energy use from on-site renewable energy installations by 2020. | -760 | 2.5 MW of renewable energy installed | n/a | n/a | n/a | Ongoing | Planning and Building |
| **Goal: Reduce methane emissions from disposed waste by achieving as close to zero waste as possible through increased diversion rates, methane capture and recovery, and other strategies.** | | | | | | | | | | |
| 13 | Recycling | Provide additional opportunities for county residents to recycle cardboard, glass, paper, and plastic products. | • Incorporate new standards for trash collection enclosures in County ordinances. At a minimum, enclosures should accommodate two 4-yard containers.<br>• Support, promote, and recognize ongoing efforts of the business community, schools, universities, and nonprofit | -6,170 | Percentage of residents and businesses with access to recycling opportunities | Minimal | Minimal | Minimal | Mid-Term | Public Works, Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | organizations to develop additional products and uses that expand the range of materials that can be recycled.<br>• Nominate businesses and institutions for recognition through CalRecycle's Waste Reduction Awards Program (WRAP).<br>• Maximize collection and participation in curbside recycling through weekly collection of recyclables in all areas with recycling service. | | | | | | | |
| 14 | Composting & Green Waste | Implement a composting and green waste program in those communities without them. | • Encourage the development of biomass, green waste, and food waste composting facilities (agricultural, residential, food service, commercial, industrial sources) for the proper management of organics in locations where land use conflicts can be minimized.<br>• Work with IWMA, Cal Poly, the school districts, and other state and local agencies to develop a Countywide Food Waste Composting Programs for businesses, schools, and residents.<br>• Implement a curbside green waste and food waste pickup in combination with existing green waste pickup, where feasible.<br>• In locations where curbside green waste and food waste pickup is not feasible, encourage residents to install home composting equipment.<br>• Partner with IWMA to develop a public education campaign for residents and businesses about composting and green waste opportunities.<br>• Amend the County's Land Use and Coastal Zone Land Use Ordinances (22.30.610) to require events that require a discretionary land use permit, to strive to achieve zero waste (or as close as possible) by recycling and composting the waste from each event. | -3,230 | Percentage of residents and businesses with access to food waste and green waste opportunities | Minimal | Minimal | Minimal | Mid-Term | Public Works |
| 15 | Construction & Demolition Waste | Reduce construction and demolition waste by requiring a minimum of 75% of nonhazardous construction and demolition debris generated on site to be recycled or salvaged. | • Update the Construction and Demolition Debris Recycling Ordinance to require increased C&D diversion rates that are phased in over the next 10 years.<br>• Promote the continued use and development of material re-use facilities and programs like Habitat for Humanity's ReStore and other private enterprises. Encourage the reuse of salvaged architecturally significant materials.<br>• Work with the construction community to identify additional recycling opportunities needed to reach C&D diversion rates (e.g., painted lumber, Styrofoam packaging).<br>• Encourage the use of post-consumer recycled content and/or certified sustainable production in building materials.<br>• Encourage building design and materials production that minimize waste. | -1,360 | 75% construction and demolition diversion rate | Low | Low | Low | Mid-Term | Public Works |
| 16 | Waste Hauling Fleet | Encourage waste haulers on contract with the County to use clean, alternative fuels for waste collection vehicles. | • Encourage the installation of alternative fueling stations and sites that are available for use by public and private vehicles, including waste fleets.<br>• Support the Air Pollution Control District and other | Supporting Measure – Not Quantified | Number of waste fleet vehicles using alternative fuels | Minimal | n/a | n/a | Mid-Term | Public Works, Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | agencies in securing funding (through grants or other mechanisms) to continue to convert waste hauling fleets to cleaner, more efficient fuels like biodiesel or compressed natural gas. | | | | | | | |
| 17 | Landfill Methane Capture | Increase methane capture rates at all operating landfills in the county. | • Ensure landfills continue to apply best management practices for landfill design, operations, and closure/post-closure practices in compliance with state regulations.<br>• Increase recovery of landfill gas for use as a biomass renewable energy source to replace energy from nonrenewable fossil fuel sources.<br>• Assist landfills in developing best management practices and new technologies for reducing GHG emissions from active landfills. | -13,120 | Methane capture rate of 80% for Cold Canyon, Chicago Grade, and Paso Robles Landfills | Low | n/a | n/a | Long-Term | Public Works, Planning and Building |
| **Goal: Reduce transportation emissions through improvements in vehicle fuel efficiency, expansion of non-auto modes of travel, and implementation of smart growth land use policies.** | | | | | | | | | | |
| 18 | Strategic Growth | Continue to implement strategic growth strategies that direct the county's future growth into existing communities and to provide complete services to meet local needs. | • Integrate higher-density development within existing communities using vacant or underutilized infill parcels and lands adjacent to existing development.<br>• Establish minimum residential densities in the residential multi-family (RMF) land use category where resources are available.<br>• Integrate complete streets policies and projects into updates of the Land Use and Circulation Element updates, Area Plans, and Community Plans.<br>• Amend applicable ordinances to facilitate pedestrian circulation within and between commercial and mixed-use sites and nearby residential areas.<br>• Update the countywide design guidelines to create maximum connectivity between neighborhoods, streets, and projects for pedestrian and bicycle travel.<br>• Promote the use of ground-floor or street-oriented space in commercial and mixed-use centers for retail, food service, financial institutions, and other high-volume commercial uses.<br>• Encourage new residential development to be within walking distance (1/2 mile or less) of public activity centers such as schools, libraries, parks, and community centers.<br>• Provide incentives for mixed-use development and land banking strategies that encourage strategic growth and infill development.<br>• Retrofit existing, older neighborhoods to improve connectivity, redesign circulation, and create walkable streets. | Included in BAU Forecast | n/a | Medium-High | n/a | n/a | Long-Term | Planning and Building |
| 19 | Transit Accessibility | Work with the San Luis Obispo Regional Transit Authority, San Luis Obispo Council of Governments, local cities, transit providers, and other agencies to identify transit nodes appropriate for mixed-use development and promote transit-oriented development where appropriate. | • Amend applicable ordinances and policies to direct most new residential development away from rural areas and to concentrate new residential development in higher-density residential areas located near major transportation corridors and transit routes, where resources and services are available.<br>• Add transit routes that provide intercity express services to provide efficient alternatives to auto trips.<br>• Allocate adequate funding for long-term transit operations to ensure higher-density residential | Included in BAU Forecast | Percentage of residents within a 1/2 mile of a transit stop | Low-Mid | n/a | n/a | Long-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | developments have access to transit opportunities. | | | | | | | |
| 20 | Affordable Housing | Continue to increase the amount of affordable housing provided in San Luis Obispo County. Affordable and below-market-rate housing provides greater opportunity for lower-income families to live closer to job and activity centers, providing residents with greater access to transit and alternative modes. | • Provide programs, incentives, and regulations for affordable mixed-use housing.<br>• Encourage mixed-use development through affordable housing programs and regulations. | -2,390 to -4,000 | 1,000 new below-market-rate housing units | Medium | Medium | Medium-High | Ongoing | Planning and Building |
| 21 | Bicycle & Pedestrian Network | Improve access to community-wide pedestrian and bicycle networks by removing barriers and providing additional bike- and pedestrian-oriented infrastructure. | • Amend applicable ordinances to direct new development to construct paths that connect land uses and other non-motorized routes and safe road crossings at major intersections.<br>• Amend applicable ordinances to direct new development to provide secure, weatherproof bicycle parking and storage facilities and ensure the long-term maintenance of such facilities.<br>• Identify abandoned rail rights-of-way not planned for transit or freight use, analyze the feasibility of their use for non-motorized transportation, and incorporate them into the County's Parks and Recreation Element, the Bikeways Plan, and the Non-Motorized Transportation Program of the Regional Transportation Plan as appropriate.<br>• Support SLOCOG and local cities in the implementation of bicycle and pedestrian master plans to facilitate non-auto travel within and between communities.<br>• Incorporate complete streets policies into the Circulation Element and implement complete streets policies on all future County roadway projects.<br>• Support the expansion of Safe Routes to School Programs to all elementary and middle schools within the county and assess potential roadway improvements for increased safety within school zones.<br>• Implement, monitor, and update the County Bikeways Plan.<br>• Support SLO Regional Rideshare and SLO County Bicycle Coalition activities and programs that promote the increased use of bicycles for transportation and recreation. | -1,600 to -8,050 | Miles of bike lane and sidewalks | High | Low-Mid | High | Long-Term | Planning and Building, Public Works |
| 22 | Parking Supply Limits | Revise County parking requirements to ensure development meets the County's strategic growth objectives while providing alternative transportation choices to project residents and employees and efficient design options, as well as flexibility to project applicants. Specifically, | • Reduce minimum parking requirements in areas such as central business districts.<br>• Work with developers to utilize in-lieu parking fees to develop concentrated parking where needed.<br>• Amend applicable ordinances and codes to provide parking options and flexibility for mixed-use development.<br>• Allow more affordable units without parking for project residents who do not wish to pay for it.<br>• Revise parking requirements for public and new | -2,010 to -19,670 | Average shared parking reductions | Low-Mid | Low-Mid | High | Mid-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | reduce parking requirements in areas where a variety of uses and services are planned in close proximity to each other and to transit. | commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity. | | | | | | | |
| 23 | Unbundle Parking Costs | Parking and property costs will be separated to enable those who choose to utilize a parking space to do so at an additional cost separate from the cost of the property. | • Amend applicable land use ordinances and policies to separate parking costs from development costs in appropriate places and sites.<br>• Modify the land use ordinance to allow more affordable units without parking for residents who do not wish to pay for it. | -170 to -4,030 | n/a | Low-Mid | Low-Mid | High | Mid-Term | Planning and Building |
| 24 | Commute Trip Reduction Programs | Continue to support voluntary commute trip reduction programs. | • Support regional work centers and identify appropriate locations for shared-use, regional work centers for public and private use.<br>• Require new residential multi-family projects subject to discretionary review to create a transportation demand management (TDM) plan, which may include:<br>– Reduced parking for affordable, workforce, or senior housing<br>– Subsidized public transportation passes<br>– Car sharing, vanpools, shuttles, or ride-matching programs<br>• Require new or expanded commercial, industrial, public, or mixed-use projects with 25 employees or more to create a TDM plan which may include:<br>– Parking cash-out,<br>– Subsidized public transportation passes,<br>– Car sharing, vanpools, shuttles, or ride-matching programs,<br>– Bicycle parking and storage facilities, and<br>– Alternative work schedules, when applicable.<br>• Consider revisions to required traffic mitigation fees where vehicle trip reduction programs will be effectively implemented over the long term.<br>• Require new or expanded mixed-use, industrial, commercial, office, or residential development (with a minimum of 15 units per acre and/or 25 employees) to provide transit passes valid for at least one year to each resident or employee for the first year of project occupancy.<br>• Continue to support SLO Regional Rideshare and the SLO County Air Pollution Control District's programs and events. | -1,700 to -3,850 | Participation in SLO Regional Rideshare programs and events | Low | Low | Medium-High | Ongoing | Planning and Building |
| 25 | Alternative Fuels | Continue to expand the use and availability of alternative and low carbon fuels for vehicles and equipment. | • Create a Neighborhood Electric Vehicle (NEV) network by identifying streets and locations appropriate for NEV use in the Circulation Element.<br>• Encourage existing car-sharing companies in San Luis Obispo County to expand to additional communities within the county.<br>• Participate in countywide efforts to establish an alternative fuel infrastructure network.<br>• Support and facilitate the development of alternative fuel technologies such as the installation of new or | -5,280 | Number of alternative fueling stations and participation in car-share programs | Medium | Medium | Medium-High | Long-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | retrofit of electric vehicle charging stations and alternative fueling stations.<br>• Ensure that alternative fuel stations and support facilities are allowed uses in land use designations that currently allow gas and service stations.<br>• Revise parking requirements for public and new commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.<br>• Continue to participate in the Air Pollution Control District's Central Coast Clean Cities Coalition (C5) program. | | | | | | | |
| **Goal: Reduce emissions from potable water use by 20% from per capita baseline levels by 2020 by prioritizing water conservation before development of new water resources.** | | | | | | | | | | |
| 26 | Water Conservation: New Construction | Reduce potable water use by 20% in all newly constructed buildings by using the prescriptive or performance method provided in the California Green Building Code to demonstrate compliance. | n/a | -80 | 20% water savings from new development | Low | Low | Medium-High | Ongoing | Planning and Building |
| 27 | Water Conservation Retrofit | Continue to enforce retrofit upon sale requirements in Los Osos and the Nipomo Mesa and facilitate compliance with SB 407 in residential and commercial properties in other unincorporated areas of the County. | n/a | Included in Water Conservation: Existing Buildings | Number of homes and businesses retrofitted | Low-Mid | Low-Mid | Medium | Near-Term | Planning and Building |
| 28 | Tiered Water Rates | Implement tiered water rate structures to incentivize water conservation. | • Evaluate existing tiered water rates for incorporated cities and CSDs within the county to determine the most effective rate structures to incentivize water conservation in County Service Areas.<br>• Through the Resource Management System, the County will track the use of tiered water rates in all water supplier areas in the county. | Included in Water Conservation: Existing Buildings | Gallons of water saved | Medium | Low-Mid | Low-Mid | Mid-Term | Public Works |
| 29 | Water Conservation: Existing Buildings | Work with local CSDs to continue to implement indoor and outdoor conservation and rebate programs. | • Identify per capita water use baselines, using sub regional or community data where available.<br>• Encourage homeowners, landlords, and tenants to install energy- and water-efficient fixtures and equipment. | -40 | Gallons of water saved | Low | Low | Low-Mid | Ongoing | Planning and Building |
| 30 | Water-Efficient Landscape | Reduce outdoor water use in new landscapes through compliance with the County's Water-Efficient Landscape Ordinance. | • Turf will not exceed 20% of the total site area on parcels 1 acre or less and 20% of landscaped areas on parcels greater than 1 acre.<br>• Irrigation controllers will have rain sensors. | Included in Water Conservation: New Development | Gallons of water saved | Low | Low-Mid | Low-Mid | Immediate | Planning and Building |
| 31 | Recycled Water | Increase the availability and use of recycled water for use in outdoor landscaping areas. | n/a | Supporting Action – Not Quantified | Acre-feet of recycled water used | Medium-High | Minimal | Minimal | Mid-Term | Public Works |
| 32 | Greywater & Rainwater | Encourage the installation and use of greywater and rainwater harvesting systems to reduce | • Develop and adopt a graywater ordinance and program, including public education that showcases | Supporting Action – Not | Number of greywater and rainwater harvesting systems | Minimal | Low | Low-Mid | Ongoing | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | outdoor potable water use. | successful local examples of graywater systems that facilitate the reuse of domestic wastewater for on-site irrigation and other water conservation measures, as appropriate. | Quantified | installed | | | | | |
| **Goal: Reduce emissions in agricultural practices through water conservation, upgrade of equipment technology, and use of best management practices.** | | | | | | | | | | |
| 33 | Agriculture Resource Conservation | Encourage voluntary energy conservation through appropriate and practicable efficient energy, water, and resource management practices. | • Support the voluntary installation of energy-efficient irrigation systems and other energy conservation system devices.<br>• Encourage the U.C. Cooperative Extension to continue its public information and research program describing water conservation techniques that may be appropriate to agricultural practices in this county that may reduce the use of combustible fuels.<br>• Encourage landowners to participate in voluntary energy conservation programs through the provision of incentives.<br>• Evaluate potential efficiency improvements in agriculture-related groundwater delivery.<br>• Encourage the State to enact legislation that promotes environmentally sustainable farming practices.<br>• Encourage participation in self-assessments and certification programs. | Supporting Action – Not Quantified | Participation in conservation programs sponsored by UCCE, RCD, and NGOs. | Low | Low | Low-Mid | Near-Term | 0 |
| 34 | Soil & Crop Management | The County will collaborate with Cal Poly, agriculturalists, the University of California Cooperative Extension (UCCE), and the County's resource conservation districts (RCDs) to develop and disseminate appropriate voluntary management practices for the application of pesticides and fertilizers, tillage practices, cover crops, and other techniques to reduce nitrous oxide emissions, maximize carbon sequestration, and reduce fuel use. | • Explore conservation and stewardship programs and specialty crop research initiatives to fund GHG reduction programs. | Supporting Action – Not Quantified | Crop fertilization rates per acre | Minimal | Low | Low | Mid-Term | Planning and Building |
| 35 | Livestock Management | Implement a voluntary fermentation and manure management program. | • Support research and pilot programs to implement best practices. | Supporting Action – Not Quantified | none | Minimal | Low | Low | Mid-Term | Agricultural Commissioner |
| 36 | Off-Road Equipment | Reduce fuel use and GHG emissions from off-road agricultural equipment. | • Support the SLO County Air Pollution Control District (APCD) programs to fund equipment upgrades, retrofits, and replacement through the Carl Moyer heavy-duty vehicle and equipment program or other funding mechanisms.<br>• Work with the APCD and agriculturalists to identify practical and feasible options for fuel-efficient agricultural equipment. | -2,810 | 5% of all tractors will be zero-emissions vehicles | Medium | Medium-High | Medium | Long-Term | Planning and Building |
| 37 | Local Foods | Reduce emissions from transport of agriculture-related products within the county through the encouragement of | • Support food systems/food shed program and develop implementation policies.<br>• Support the development of community garden programs in unincorporated communities. | Supporting Action – Not Quantified | Number of community gardens<br>Number of farmers markets | Low | Low | Low | Mid-Term | Planning and Building |

| # | Policy Topic | Reduction Measure | Actions | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | Community Costs | Community Savings | Implementation Time Frame | Responsible Agencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | | local food programs. | • Continue support of local initiatives to increase local sales of produce grown in SLO County and other agricultural products, including but not limited to the "SLO Grown" campaign and the permitting of local farmers markets.<br>• Encourage procurement of locally grown and/or produced food for all county events.<br>• Encourage County vendors and concessionaires to procure and provide locally grown and/or produced food.<br>• Support and promote the USDA "Farm to School Initiative" and "Know Your Farmer, Know Your Food" programs.<br>• Create a local foods program to support food security, local economic development, health, and other benefits. | | | | | | | |
| 38 | Agricultural Employee Transportation | Reduce VMT associated with commuting by agricultural workers. | • Support rideshare programs for agricultural worker transit, shuttles, and ride matching.<br>• Publicize the availability of this program to the agricultural community. | Supporting Measure – Included in Commute Trip Reduction Programs | Participation in SLO Regional Rideshare programs | Minimal | Low | Low-Mid | Ongoing | SLOCOG |
| 39 | Sequestration | Identify opportunities for terrestrial and aquatic sequestration in the county, including but not limited to County lands, reclaimed mining lands, agricultural lands, and other areas as appropriate. | • Support preparation of a countywide sequestration assessment of agricultural and open space lands, forests, and aquatic resources.<br>• Support research and implementation through the development of a working group to convene agriculturalists, researchers, and other experts to explore local opportunities and best practices to capture and store carbon.<br>• Explore opportunities for carbon sequestration to be integrated with existing open space acquisition for conservation programs.<br>• Explore opportunities for carbon sequestration to be integrated with natural resource or conservation-based mitigation banking and offset programs. | Supporting Measure – Not Quantified | Acres of land used to sequester carbon | Medium | Low-Mid | Low-Mid | Long-Term | Planning and Building |
| **All Local Reduction Measures** | | | | **-134,620** | | | | | | |

**Table 8-3.** County Operations Implementation Program

| Measure | | Action Items | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | County Savings | Timeframe | Responsible Department |
|---|---|---|---|---|---|---|---|---|
| **Goal: Reduce energy use in existing County facilities 20 percent by 2020.** | | | | | | | | |
| E 1 | Continue to retrofit existing County facilities and implement energy conservation measures and efficiency programs. | • Implement HVAC and lighting retrofits as identified in energy audits.<br>• Complete weatherization measures and HVAC adjustments to improve occupant thermal comfort and reduce the use of personal heating and cooling devices.<br>• Identify and implement energy-saving measures when leasing or purchasing additional facilities for County use.<br>• Incorporate demonstration and educational energy conservation measures improvements into County facilities.<br>• Continue to pursue funding sources to implement additional energy efficiency measures at existing County facilities, including grants, low-interest loans, and reinvestment of energy cost savings from retrofits already completed. | -370 | Number of facilities retrofitted<br>Energy savings at County facilities | Medium | Medium | Mid-Term | General Services Agency |
| E 2 | Promote energy conservation through educational and competition-based programs. | • Enroll and participate in the Energy Star Challenge.<br>• Develop a competition among County departments to conserve energy. | -90 | Participation in energy conservation programs<br>Energy savings at County facilities | Low | Low-Mid | Mid-Term | County Green Team |
| E 3 | Reduce computer energy use through software, hardware, and network upgrades. | • Upgrade remote access capabilities to allow employees to access the network remotely rather than through County desktop computers.<br>• Require all new computers, monitors, and office equipment to be Energy Star certified. | -10 | Number of EnergyStar certified computers, monitors, and pieces of office equipment | Low | Low | Mid-Term | General Services Agency |
| E 4 | Develop green building operation and maintenance guidelines to be followed by County employees and contractors. | | Supporting Measure – Not Quantified | None | Low | Low | Near-Term | General Services Agency |
| E 5 | Continue to plant trees for building shading and carbon sequestration purposes. | • Plant additional deciduous trees along south-, east-, or west-facing walls to reduce building heat gain where the trees will not interfere with sewer laterals and/or photovoltaic installations.<br>• Continue to replace damaged or diseased trees and plant additional trees at County parks and golf courses.<br>• Continue to plant trees in County parks through the Parks Foundation Plant-a-Tree donation program.<br>• Encourage tree mitigation projects on County parks and lands. | -70 | Number of trees planted | Low-Mid | Low | Mid-Term | General Services Agency |
| E 6 | Replace lighting and traffic signal fixtures with more efficient light-emitting diode (LED) lighting. | • Retrofit streetlights with LED lighting technology.<br>• Retrofit traffic signals with LED light fixtures. | -20 | Number of streetlights and traffic signals retrofitted | Low | Low-Mid | Near-Term | Public Works |
| E 7 | Require new or renovated County facilities to meet or exceed CALGreen's Tier 1 or the intent of LEED Silver requirements. | • Continue to require Utility Coordinator review of new facilities for opportunities to meet or exceed energy efficiency requirements.<br>• Orient and design new facilities to maximize natural lighting and climate regulation.<br>• "Right-size" new facilities to meet anticipated uses.<br>• Pre-wire new facilities to accommodate solar PV and/or electric car charging stations. | -260 | Number of facilities achieving Tier 1 or LEED Silver requirements | Low-Mid | Medium | Ongoing | General Services Agency |

| Measure | | Action Items | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | County Savings | Timeframe | Responsible Department |
|---|---|---|---|---|---|---|---|---|
| **Goal: Increase the use of renewable energy sources in County facilities to account for 10% of total energy used.** | | | | | | | | |
| RE 1 | Explore opportunities to install alternative energy and co-generation facilities. | • Install solar PV on facilities with adequate space and orientation.<br>• Consider use of solar equipment to support lighting facilities at County parks, parking lots, restrooms, and for irrigation pumping.<br>• Install co-generation equipment at County facilities.<br>• Install renewable energy systems like co-generation or solar thermal hot water equipment at County pool facilities.<br>• Seek funding or financing opportunities for renewable energy installations on County facilities. | -700 | Megawatts of renewable energy installed | High | High | Mid-Term | General Services Agency |
| **Goal: Reduce the amount of waste generated at County facilities and increase the County's waste diversion rate to 80% by 2020.** | | | | | | | | |
| W 1 | Work with the Integrated Waste Management Authority (IWMA) to develop and implement a recycling program at the County's parks and golf courses. | | -30 | Percentage of parks and golf courses with recycling facilities | Medium | Low | Mid-Term | General Services Agency |
| W 2 | Continue to implement paperless records management and reduce the amount of paper purchased. | Continue to post public documents, agendas and staff reports online, and consider charging a fee for printed materials. | -10 | Annual print counts | Low-Mid | Medium | Ongoing | General Services Agency |
| W 3 | Develop and implement an environmentally preferable purchasing (EPP) policy to purchase recycled content and toxic-free products for County supplies, equipment, and services and to promote recycling markets. | | Supporting Action – Not Quantified | none | Low-Mid | Low | Near-Term | General Services Agency |
| W 4 | Explore opportunities to compost food and yard waste at County facilities. | • Identify the potential facilities where effective composting can be accomplished in addition to green waste. | -80 | Amount of food waste and green waste diverted at County facilities | Medium | Low-Mid | Mid-Term | General Services Agency |
| W 5 | Require a minimum of 75% of County non-hazardous construction and demolition waste to be salvaged or recycled. | • County departments will continue to offer materials and equipment to other county facilities prior to disposal. | -20 | Percentage of construction and demolition waste diverted from County projects | Low | Low | Ongoing | Public Works, General Services Agency |
| W 6 | Continue to auction off retired vehicles and equipment. | | Supporting Measure – Not Quantified | County fleet size<br>Number of vehicles auctioned | Low | Medium | Ongoing | General Services Agency |
| **Goal: Reduce emissions from the County's vehicle fleet by using alternative fuels and decreasing vehicle miles traveled.** | | | | | | | | |
| VF 1 | Substantially increase the number and proportion of alternative fuel, high fuel economy, electric, and hybrid vehicles and use of these vehicles within the County's fleet. | • Promote employee use of hybrid vehicles when available over less fuel-efficient vehicles.<br>•Review ongoing vehicle replacement acquisitions within the County fleet for opportunities to substitute alternative fuel vehicles, hybrid vehicles and all electric vehicles for conventional gasoline powered vehicles. | -60 | Number of hybrid vehicles<br>Reduction in fuel use | Low-Mid | Low-Mid | Ongoing | General Services Agency |
| VF 2 | Increase participation in the County's car-sharing membership. | • Provide incentives and management support to facilitate use of carsharing by all departments as an option to reduce the size of the County-owned vehicle fleet..<br>• Work with car-sharing companies to expand the availability of car sharing vehicles throughout the county. | -60 | Number of participants in car-share membership<br>Annual VMT in car-share vehicles<br>VMT/fleet size of County vehicles | Medium | Low | Ongoing | All Departments |

| Measure | | Action Items | 2020 GHG Reductions (MTCO2e/yr) | 2020 Progress Indicators | County Costs | County Savings | Timeframe | Responsible Department |
|---|---|---|---|---|---|---|---|---|
| VF 3 | Explore the use of alternative fuels in County vehicles and support the development of alternative fueling stations within the County through participation in the Central Coast Clean Cities Coalition (C5). | • Develop additional fueling and storage facilities for the County's vehicle fleet. | -3 | Number of alternative-fuel vehicles | Low-Mid | Low | Long-Term | General Services Agency |
| **Goal: Provide additional opportunities for employees to utilize alternative transportation options and reduce commute lengths.** | | | | | | | | |
| EC 1 | Take into consideration facility location, proximity to other facilities, access to transit, and ability to provide bike storage facilities when constructing or leasing new facilities. | • Locate facilities within a ½ mile of transit stops or centers.<br>• Include bicycle commuter facilities, including bike storage, lockers, and showers, at all new and remodeled facilities. | -290 | Number of new facilities within a 1/2 mile of transit<br>Employee commute mode share | Low | n/a | Long-Term | General Services Agency |
| EC 2 | Increase participation in Rideshare commuter programs. | • Provide targeted outreach to departments with less than 25% participation in Rideshare programs.<br>• Encourage additional participation in Rideshare's Bike Month and Commute for Cash Challenges. | -80 | Participation in SLO Regional Rideshare programs | Low | n/a | Ongoing | All Departments |
| EC 3 | Standardize County telecommuting and alternative work schedule policies among departments to facilitate participation as appropriate to job classifications. | | -240 | Number of employees telecommuting<br>Number of employees utilizing alternative work schedules | Low | n/a | Near-Term | All Departments |
| EC 4 | Implement workplace parking pricing at County employment centers in Downtown San Luis Obispo. Charge employees wishing to utilize a parking space provided by the County a daily or monthly fee. | • Utilize the funds collected from employee parking charges to fund alternative commute programs. | -40 | Employee commute mode share | Generates revenues | n/a | Mid-Term | General Services Agency |
| **Goal: Reduce water use in County facilities 20% by 2020.** | | | | | | | | |
| WC 1 | Retrofit facilities with water-efficient fixtures. | • Install timers and sensors on toilet and sink fixtures in all facilities.<br>• Replace inefficient water fixtures with efficient models that do not exceed 1.6 gallons per flush for toilets and 2.0 gallons per minute for showers. | Supporting Measure – Not Quantified | Number of fixtures replaced | Low-Mid | Low-Mid | Mid-Term | General Services Agency |
| WC 2 | Replace County-maintained turf landscapes (not including park recreational fields or areas) with water-efficient landscapes and demonstration gardens. | • Evaluate existing irrigation systems to identify leaks and replace irrigation heads with more efficient fixtures.<br>• Replace turf areas that are not used for recreation purposes with native species and drip irrigation systems. | Supporting Measure – Not Quantified | Acres of turf replaced with native landscape | Low-Mid | Low-Mid | Mid-Term | General Services Agency |
| WC 3 | Continue to reduce water use on County golf courses through participation in the Audubon International Cooperative Sanctuary Program. | | Supporting Measure – Not Quantified | Reduction in water use at County golf courses | Low-Mid | Medium | Ongoing | General Services Agency |



# GLOSSARY

# GLOSSARY

**Agricultural Activity:** Includes, but is not limited to, cultivation, growing, harvesting, and production of any agricultural commodity and appurtenant practices incidental to the production of agricultural commodities.

**Air Basin:** A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined by CARB along political boundary lines and include both the source and receptor areas. California is currently divided into 15 air basins.

**Air Pollutants:** Amounts of foreign and/or natural substances occurring in the atmosphere that may result in adverse effects to humans, animals, vegetation, and/or materials.

**American Recovery and Reinvestment Act (ARRA):** Commonly referred to as the Stimulus Plan or Recovery Act, ARRA is an economic stimulus package enacted by the federal government in 2009. The intent of the stimulus is to create jobs and promote investment and consumer spending during the economic recession.

**Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006:** Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases (GHG) for the State of California. Designates the California Air Resources Board (CARB) as the responsible agency for monitoring and reducing statewide GHG emissions to reduce emissions to 1990 levels by 2020.

**Assembly Bill (AB) 811:** Authorizes all cities and counties in California to designate areas within which willing property owners may finance the installation of distributed renewable energy generation, as well as energy efficiency improvements through low-interest loans. These financing programs are commonly referred to as Property Assessed Clean Energy, or PACE programs.

**Assembly Bill (AB) 939:** Establishes a goal of achieving a statewide waste diversion rate of 50% and requires cities and counties to divert a minimum of 50% of their waste stream for reuse or recycling.

**Buildout; Build-out:** Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning designations.

**Business-As-Usual (BAU):** A business-as-usual projection forecasts greenhouse gas emissions without regulatory or technical intervention to reduce GHG emissions.

**California Green Building Standards Code (CALGreen):** The 2010 California Green Building Standards Code, commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Buildings Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics.

**California Climate Adaptation Strategy (CAS):** Summarizes the best-known science on climate change impacts to California and provides recommendations on how to manage the risks.

**California Environmental Quality Act (CEQA):** A state law requiring state and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an environmental impact report (EIR) must be prepared and certified as to its adequacy before action can be taken on the proposed project. General plans require the preparation of a program EIR.

**California Solar Initiative (CSI):** Allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities (IOUs): Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE).

**Carbon Dioxide ($CO_2$):** A colorless, odorless gas that occurs naturally in the earth's atmosphere. Significant quantities are also emitted into the air by fossil fuel combustion. (See also the California Climate Change Glossary.)

**Carbon Dioxide Equivalent ($CO_2e$):** A metric measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP).The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

**Carbon Sequestration:** The process through which agricultural and forestry practices remove carbon dioxide ($CO_2$) from the atmosphere. The term "carbon sinks" is also used to describe agricultural and forestry lands that absorb $CO_2$.

**Carl Moyer Program:** Created to reduce air pollution emissions from older heavy-duty diesel engines. The program offers incentives to on-road and off-road heavy-duty vehicle owners to retrofit the engine or replace the entire vehicle with a cleaner or alternative fuel engine.

**Car Sharing:** A type of car rental where people rent cars for short periods of time, often by the hour.

**Central Coast Clean Cities Coalition (C5):** A local group of stakeholders with a goal to expand the use and available infrastructure of alternative fuel vehicles. The group includes members from local schools and universities, fuel providers, government agencies, and the general public.

**Central Coast Vineyard Team (CCVT):** The team was created in 1994 and is a group dedicated to the research and promotion of environmentally friendly farming practices.

**Clean Air Act:** Requires EPA to set National Ambient Air Quality Standards for six common air pollutants, known as "criteria pollutants," that are found all over the United States: particle pollution (particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. EPA regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels.

**Clean Car Fuel Standards (AB 1493, Pavley):** Signed into law in 2002 and commonly referred to as Pavley standards. Require carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

Climate Action Plan (CAP): CAPs are strategic plans that establish policies and programs for reducing (or mitigating) a community's greenhouse gas (GHGs) emissions and adapting to the impacts of climate change. This plan serves the function of a CAP.

**Climate Change (also referred to as global climate change):** The term "climate change" is sometimes used to refer to all forms of climatic inconsistency, but because the earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term "global warming"; scientists however, tend to use the term in the wider sense to also include natural changes in climate.

**Climate Change Adaptation:** The adjustment in natural or human systems to respond to actual or expected climate changes to minimize harm or take advantage of beneficial opportunities.

**Climate Change Mitigation:** A technical or behavioral intervention to reduce the sources of greenhouse gas emissions in order to reduce the potential effects of climate change.

**Climate Zone:** The California Energy Commission has classified the distinct climates throughout California by climate zone to recognize the variability in energy use based on local weather patterns. The Energy Commission uses these climate zones to determine energy budgets for new and renovated buildings and prescriptive packages for each climate zone to ensure that they meet the State's Title 24 energy efficiency standards.

**Co-Benefits:** An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing greenhouse gas emissions. In this document, the co-benefits are defined as follows:

- Conserves Energy
- Improves Air Quality
- Promotes Equity
- Improves Public Health
- Supports Local Economy
- Reduces Water Use
- Improves Mobility
- Provides Educational Opportunities
- Provides Monetary Savings
- Adaptation Measure
- Implements State Policy

**Community Service District (CSD):** A geographic subarea of the county used for the planning and delivery of services based on an assessment of the service needs of the population in that subarea. A CSD is a taxation district with independent administration.

**Complete Streets:** Complete Streets policies ensure that transportation planners and engineers consistently design and operate the entire roadway with all potential users in mind. This includes bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities. In 2007, the State of California adopted AB 1358, which directs the legislative body of a city or county, upon revision of the circulation element of its general plan, to identify how the jurisdiction will provide for the routine accommodation of all users

**Compressed Natural Gas (CNG):** A fossil-fuel substitute for gasoline, diesel, or propane that can be used in passenger and heavy-duty vehicles.

**Conservation:** Planned management of a natural resource to prevent exploitation, destruction, or neglect.

**Conservation and Open Space Element (COSE):** The COSE is an element of the County's General Plan and includes goals, policies, and implementation strategies related to air quality, biological resources, cultural resources, energy, minerals, open space, soils, visual resources, and water resources. The COSE was updated and adopted by the Board of Supervisors in 2010 and includes several goals and policies related to climate change and greenhouse gas reductions.

**Construction and Demolition Waste (C&D):** C&D materials consist of the waste generated during the construction, demolition, or renovation of buildings, roads, and other construction projects. C&D materials may include heavy, bulky materials such as concrete, glass, wood, and metal, among other materials.

**Development (Coastal):** Pursuant to Public Resources Code 30106, development means, on land or in or under water, the placement or erection of any solid material or structure; discharge or disposal of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land, including, but not limited to, subdivision pursuant to the Subdivision Map Act (commencing with Section 66410 of the Government Code), and any other division of land, including lot splits, except where the land division is brought about in connection with the purchase of such land by a public agency for public recreational use; change in the intensity of use of water, or of access thereto; construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (commencing with Section 4511). As used in Section 4511, the term "structure" includes, but is not limited to, any building, road, pipe, flume, conduit, siphon, aqueduct, telephone line, and electrical power transmission and distribution line.

**Development (Inland):** For purposes of implementing the Conservation and Open Space Element and EnergyWise or Climate Action Plan, development is any activity or alteration of the landscape, its terrain contour, or vegetation, including the erection or alteration of buildings or structures. Development does not include crop production or grazing. New development is any construction, or alteration of an existing structure or land use, or establishment of a land use after the effective date of Title 22.

**Discretionary Development:** Development that is subject to a discretionary permit that requires the exercise of judgment and the resolution of factual issues to determine if the application and requested entitlement conform with the provisions of the Land Use Ordinance

(Titles 22 and 23). Generally, a discretionary permit consists of any entitlement that requires a decision to approve, approve subject to conditions, or disapprove, based on the judgment of the Planning Commission after a hearing.

**Distributed Energy Resources (DER):** Small, modular, energy generation and storage technologies that provide electric capacity or energy located where it's needed. DERs typically produce less than 10 megawatts (MW) of power and include wind turbines, photovoltaics (PV), fuel cells, microturbines, reciprocating engines, combustion turbines, cogeneration, and energy storage systems. DER systems may be either connected to the local electric power grid or isolated from the grid in stand-alone applications.

**Easement, Conservation:** A tool for acquiring open space with less than full-fee purchase, whereby a public agency buys only certain specific rights from the landowner. These may be positive rights (providing the public with the opportunity to hunt, fish, hike, or ride over the land) or they may be restrictive rights (limiting the uses to which the landowner may devote the land in the future).

**Emission Standard:** The maximum amount of pollutant legally permitted to be discharged from a single source, either mobile or stationary.

**Energy Conservation:** Reducing energy waste, such as turning off lights, heating, and motors when not needed.

**Energy Efficiency:** Doing the same or more work with less energy, such as replacing incandescent light bulbs with compact fluorescent light bulbs or buying an Energy Star appliance to use less energy for the same or greater output.

**Energy Efficiency and Conservation Block Grant (EECBG):** The EECBG program was funded through the American Recovery and Reinvestment Act and managed by the Department of Energy to assist cities, counties, states, and territories to develop, promote, and implement energy efficiency and conservation programs and projects.

**Energy Efficiency Standards (Title 24, Part 6):** Title 24 standards were first adopted in 1978 and established minimum energy efficiency standards for residential and nonresidential buildings. These standards are updated continually by providing more stringent energy budgets for new buildings in an effort to reduce California's energy consumption.

**Energy Star:** A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy to provide consumers with information and incentives to purchase the most energy-efficient products available.

**Energy Star Portfolio Manager:** An online management tool that allows nonresidential building owners and tenants to track and assess energy and water use over time. Benchmarking energy and water use allows building owners to identify investment priorities, determine underperforming buildings, and verify efficiency improvements.

**Environment:** In CEQA, "the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, mineral, flora, fauna, noise, and objects of historic or aesthetic significance."

**Environmental Impact Report (EIR):** A report required by the California Environmental Quality Act (CEQA) which assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action or project. See California Environmental Quality Act (CEQA).

**Environmentally Preferable Purchasing (EPP):** California law requires State government to practice Environmentally Preferable Purchasing, which is the procurement of goods and services that have a reduced impact on human health and the environment as compared to other goods and services serving the same purpose.

**Feasible:** Capable of being accomplished in a successful manner within a reasonable time taking into account economic, environmental, social, and technological factors.

**Floodplain:** The relatively level land area on either side of the banks of a stream regularly subject to flooding. That part of the floodplain subject to a 1 percent chance of flooding in any given year is designated as an "area of special flood hazard" by the Federal Insurance Administration.

**Floodway:** The channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the 100-year flood without cumulatively increasing the water surface elevation more than 1 foot.

**Fossil Fuel Facilities:** Include, but are not limited to, oil and gas wells, separators, and refineries.

**Global Warming Potential (GWP):** An index used to translate the level of emissions of various gases into a common measure in order to compare the relative potency of different gases without directly calculating the changes in atmospheric concentrations. Greenhouse gases are expressed in terms of carbon dioxide equivalent. Global warming potentials are expressed in terms relative to carbon dioxide, which has a global warming potential of 1.

**Green Building:** Sustainable or "green" building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community. See California green Building Standards Code for green building regulations in California.

**Greenhouse Gas or Greenhouse Gases (GHG):** Gases which cause heat to be trapped in the atmosphere, warming the earth. Greenhouse gases are necessary to keep the earth warm, but increasing concentrations of these gases are implicated in global climate change. Greenhouse gases include all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The majority of greenhouse gases come from natural sources, although human activity is also a major contributor.

**Greenhouse Gas Inventory:** A greenhouse gas (GHG) inventory provides estimates of the amount of GHGs emitted to and removed from the atmosphere by human activities. A city or county that conducts an inventory looks at both community emission sources as well as emissions from government operations. A base year is chosen and used to gather all data from that year. Inventories include data collection from such things as vehicle miles traveled (VMTs), energy usage from electricity and gas, and waste. Inventories include estimates for carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), sulfur hexafluoride ($SF_6$), hydroflourocarbons (HFCs), and perflourocarbons (PFCs), which are referred to as the six Kyoto gases.

**Green Waste:** Refers to lawn, garden, or park plant trimmings and materials and can be used in home-composts or picked up curbside by municipal waste haulers.

**Greywater:** See Recycled Water.

**Groundwater:** Subsurface water in a zone of saturation.

**Groundwater Overdraft:** Develops when long-term groundwater extraction exceeds aquifer recharge, producing declining trends in aquifer storage. Overdraft is usually evident by declines in surface-water levels and stream flow, reduction or elimination of vegetation, land subsidence, and seawater intrusion.

**Groundwater Recharge:** Any of the approved methods that are designed to detain or slow surface water runoff so that percolation is enhanced.

**Habitat:** The physical location or type of environment in which an organism or biological population lives or occurs.

**Habitat Conservation Plan (HCP):** A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area.

**Imported Water:** Water brought into the county from outside its boundaries (e.g., State Water Project).

**Indicator:** Types of data or information that can be used to determine the progress or success of each reduction measure.

**Integrated Regional Water Management Plan:** A Strategic Plan for Sustainable Water Resources to Meet Human and Environmental Needs in San Luis Obispo County.

**Invasive Species:** Species that establish and reproduce rapidly outside of their native range and may threaten the diversity or abundance of native species through competition for resources, predation, parasitism, hybridization with native populations, introduction of pathogens, or physical or chemical alteration of the invaded habitat

**Landings and Take-Offs:** Refers to the aircraft operations that occur below 3,000 feet in altitude.

**LEED:** Leadership in Energy and Environmental Design, a standard established by the U.S. Green Building Council.

**Level of Service (LOS) Standard:** A standard used by government agencies to measure the quality or effectiveness of a municipal service such as police, fire, or library, or the performance of a facility, such as a street or highway.

**Life Cycle Costing (LCC):** The process of evaluating the total overall costs and benefits of buildings or equipment over time, including initial costs of design and construction; operating costs; long-term costs of maintenance, repair, and replacement; and other environmental or social costs over its full life, rather than simply based on purchase cost alone.

**Light-Emitting Diode (LED):** A lower energy consuming and longer-lasting alternative to incandescent and compact fluorescent light bulbs.

**Low Carbon Fuel Standard (S-1-07):** An executive order from former Governor Schwarzenegger, the Low Carbon Fuel Standard established the goal of reducing the carbon intensity of transportation fuels in California by 10% by 2020.

**Low Impact Development (LID):** An innovative stormwater management approach with a basic principle to design the built environment to remain a functioning part of an ecosystem rather than exist apart from it. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

**Metropolitan Planning Organization (MPO):** A federally funded transportation planning organization comprising representatives from local government agencies and transportation authorities. See San Luis Obispo Council of Governments (SLOCOG) for more information on the local MPO.

**Mixed Use:** Properties on which various uses such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with significant functional interrelationships and a coherent physical design. A single site may include contiguous properties.

**National Ambient Air Quality Standards:** The prescribed level of pollutants in the outside air that cannot be exceeded legally during a specified time in a specified geographical area.

**Native Species:** A species within its natural range or natural zone of dispersal, i.e., within the range it would or could occupy without direct or indirect introduction and/or care by humans.

**Natural Area Preserve:** An area of land or water managed by County Parks, a similar public agency, or a private nonprofit which remains in a predominantly natural or undeveloped state to provide resource protection and passive recreation for present and future generations.

**Neighborhood Electric Vehicle (NEV):** Small, battery-powered, low-speed electric vehicles. NEVs are typically limited to streets with a posted speed limit of 25 mph or less. NEVs are classified by the California Air Resources Board as zero emissions vehicles, as they do not produce any tailpipe emissions.

**Nonattainment:** The condition of not achieving a desired or required level of performance. Frequently used in reference to air quality.

**Non-Renewable Energy:** Energy from sources that use a non-renewable natural resource such as uranium or fossil fuels such as coal, oil, or natural gas.

**Oak:** Any species in the genus Quercus.

**Oak Woodlands:** Per the California Oak Woodlands Conservation Act, an oak stand with a greater than 10% canopy cover or that may have historically supported greater than 10% canopy cover.

**Off-Road Equipment:** In this Plan, off-road equipment refers to agriculture equipment used for the production, transport, and maintenance of agricultural land. Agricultural off-road equipment includes tractors, tillers, sprayers, swathers, and balers, among other equipment types.

**Operations and Maintenance (O&M):** Refers to the activities related to the routine, preventive, predictive, scheduled, and unscheduled actions aimed at preventing equipment failure or decline with the goal of increasing efficiency, reliability, and safety.

**Ordinance:** A law or regulation set forth and adopted by a governmental authority, usually a city or county.

**Ozone:** Produced when gases or vapors created by cars, solvents, factories, and pesticides mix and react in the presence of sunlight. This results in certain health effects such as breathing difficulties, lung damage, coughing, and chest pains.

**Particulate Matter ($PM_{10}$) and Fine Particulate Matter ($PM_{2.5}$):** Fine mineral, metal, smoke, soot, and dust particles suspended in the air. While particulate matter also has many natural sources, human-derived sources such as vehicle exhaust, road dust, mineral quarries, grading, demolition, agricultural tilling, and burning are major contributors to exceedances in San Luis Obispo County. In addition to reducing visibility, particulate matter can lodge in the lungs and cause serious, long-term respiratory illness and other health problems. The smaller the size of the particle, the deeper it can penetrate into the lungs, and the more difficult it is to expel.

**Preservation:** To keep safe from injury, harm, or destruction.

**Property Assessed Clean Energy (PACE):** See Assembly Bill 811.

**Recycled Water, Reclaimed Water, Treated Sewage Effluent Water, or Greywater:** Treated or recycled wastewater of a quality suitable for non-potable uses such as landscape irrigation; not intended for human consumption.

**Reduction Measure:** A goal, strategy, program, or set of actions that target and reduce a specific source of greenhouse gas emissions.

**Regional Transportation Plan:** A long-term blueprint of the region's transportation systems. The RTP is a federally mandated comprehensive long-range regional planning document that identifies the region's transportation needs, sets forth an action plan of projects, determines actions and programs to address the needs and issues, and documents the financial resources needed to implement the RTP. The San Luis Obispo Council of Governments adopted the 2010

Regional Transportation Plan – Preliminary Sustainable Communities Strategy in December 2010.

**Renewable Energy:** Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.

**Renewable Energy Secure Community (RESCO):** Analyzes the renewable energy resources and potential within a community. The resources identified through the RESCO include solar, wind, biogas, energy efficiency, and energy storage.

**Renewable Portfolio Standard (RPS):** A regulation requiring utility companies in California to increase the production of renewable energy from solar, wind, or biomass, or geothermal sources.

**Retrofit Upon Sale:** Requirements on real property to replace inefficient water or energy fixtures as a condition of escrow. Retrofit upon sale requirements typically require a certificate or other form of verification from local government agencies to ensure that the fixtures are replaced and meet minimum efficiency requirements.

**Rideshare:** In this Plan, Rideshare refers to the San Luis Obispo Regional Rideshare Program to educate and encourage residents and employers about the alternative transportation options available in their community. Rideshare also facilitates alternative transportation events and contests like SLO Bike Month and the Commute for Cash Challenge.

**Safe Routes to School (SR2S or SRTS):** A national movement aimed at providing safe environments to encourage walking and bicycling surrounding local schools through engineering, enforcement, education, encouragement, and evaluation. Safe Routes to School programs are typically funded through federal, state, and local grants. SR2S is the California program; SRTS is the national program.

**San Luis Obispo Council of Governments (SLOCOG):** SLOCOG is the San Luis Obispo County's Metropolitan Planning Organization responsible for preparing and implementing regional plans and programs related to transportation and other issues of regional concern.

**Scopes:** Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are defined as follows:

- **Scope 1** – Direct emissions sources located within the unincorporated areas of the county, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas. GHG emissions from off-road agriculture

equipment and nitrogen fertilizer application are considered Scope 1 emissions, while methane emissions from livestock are considered Scope 3.

- **Scope 2** – Indirect emissions that result because of activities in the unincorporated areas of the county and limited to electricity, district heating, steam and cooling consumption. Scope 2 emissions sources include purchased electricity used in the unincorporated areas and associated with the generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community's electricity consumption.

- **Scope 3** – All other indirect emissions that occur as a result of activity in the unincorporated areas. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside of the unincorporated areas of the county.

**Senate Bill (SB) 7:** Passed in 2009, SB 7 requires the state to achieve a 20% reduction in per capita water use by 2020. This law also requires local water providers to comply with the 20% reduction at the risk of becoming ineligible for state grant or loan funding.

**Senate Bill (SB) 97:** Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act.

**Senate Bill (SB) 375:** Directs the Metropolitan Planning Organizations in California to create a Sustainable Communities Strategy as part of the Regional Transportation Plan. The SCS will demonstrate how the region will achieve the 2020 and 2035 GHG reduction targets for the region set by CARB.

**Senate Bill (SB) 407:** Adopted in 2010, SB 407 requires inefficient plumbing fixtures be replaced with more efficient models at the time of property sale or improvement. See Retrofit Upon Sale.

**Senate Bill (SB) 610** (Chaptered at Water Code 10910): Requires CEQA review of certain large residential and commercial projects to include a water supply assessment that proves that adequate water exists for the project.

**Senate Bill (SB) 1016:** Adopted in 2008, SB 1016 establishes per capita waste disposal rate requirements and goals for local agencies in California. The requirements are expressed in a pounds per person per day measurement.

**Senate Bill (SB) 1881:** Requires local agencies to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

**Smart Grid:** The smart grid delivers electricity from suppliers to consumers using two-way digital communications. The smart grid is envisioned to overlay the ordinary electrical grid with an information and net metering system, which includes smart meters. Smart meters will allow consumers to become more aware of their energy use and in the future will allow smart grid enabled appliances to be pre-programmed to operate at a time when electricity costs are lowest.

**Solar Reflectance Index (SRI):** SRI is a value used to measure a materials temperature in the sun that incorporates both solar reflectance and emittance into a single value. SRI is expressed as a fractional value between 0 and 1, with a standard white surface receiving a value of 0 and a black surface a value of 1.

**Strategic Growth:** In San Luis Obispo County, strategic growth refers to the principles defined by SLOCOG through the development of the Community 2050 Regional Growth Strategy. The Strategic Growth Principles are defined as follows:

1) Strengthen and Direct Development Toward Existing Communities
2) Foster Distinctive, Attractive Communities with a Strong Sense of Place
3) Create Walkable Neighborhoods and Towns
4) Create a Range of Housing Opportunities and Choices
5) Provide a Variety of Transportation Choices
6) Preserve Open Space, Farmland, Natural Beauty and Critical Environmental Areas
7) Encourage Mixed Land Uses
8) Take Advantage of Compact Building Design
9) Make Development Decisions Predictable, Fair and Cost Effective
10) Encourage Community & Stakeholder Collaboration
11) Strengthen Regional Cooperation

**Sustainability:** Community use of natural resources in a way that does not jeopardize the ability of future generations to live and prosper.

**Sustainability in Practice (SIP) Certification:** A third-party verified certification program to recognize a vineyard's and winery operation's commitment to environmental stewardship, equitable treatment of employees, and economic stability.

**Sustainable Communities Strategy (SCS):** The land use element of each MPO's Regional Transportation Plan as required by SB 375. The SCS will demonstrate how the region will achieve the 2020 and 2035 VMT and GHG reduction targets for the region set by CARB. In 2010, SLOCOG adopted a Preliminary Sustainable Communities Strategy (PSCS) to maximize the efficiency of existing infrastructure and strengthen the land use – transportation connection through sustainable land use.

**Sustainable Development:** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Transit-Oriented Development (TOD):** A mixed-use residential or commercial area designed to maximize access to transit options.

**Transportation Demand Management (TDM) Plan:** A voluntary or mandatory program developed by local agencies, large employers, or high traffic commercial services to limit the amount of congestion and pollution related to transportation demand. TDM plans may include incentives, regulations, and education about transportation alternatives.

**Trustee Agency:** A state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California. There are four trustee agencies: the Department of Fish and Game, the State Lands Commission, the Department of Parks and Recreation, and the University of California.

**Urban Heat Island:** The term "heat island" describes built-up areas that are hotter than nearby rural areas. On a hot, sunny summer day, roof and pavement surface temperatures can be 50–90°F (27–50°C) hotter than the air, while shaded or moist surfaces remain close to air temperatures. These surface urban heat islands, particularly during the summer, have multiple impacts and contribute to atmospheric urban heat islands. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.

**Urban Reserve:** An area outside of an urban service area but within an urban growth boundary, in which future development and extension of municipal services are contemplated but not imminent.

**Urban Reserve Line:** As defined in Framework for Planning, Part I of the Land Use Element. [Amended 1995, Ord. 2741]

**Vehicle Miles Traveled (VMT):** A key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve regional air quality goals.

**Volatile Organic Compounds (VOC):** A variety of chemicals with both short- and long-term adverse health effects. VOCs are emitted as gases from a wide array of products such as paints, lacquers, cleaning supplies, markers, and office equipment and furnishings.

**Vulnerable Populations:** There are three primary segments of vulnerable populations: those at risk to adverse climate change impacts due to exposure, sensitivity, or adaptive capacity.

- Exposure: Physical conditions may put particular populations at risk to the impacts of climate change. For instance, populations living in low-lying or coastal areas may be more exposed to flooding events and sea level rise, while those who work outside may suffer from health-related issues due to increased temperatures and decreased air quality.

- Sensitivity: Certain populations, including young children and those over the age of 65, are physiologically more sensitive to extreme temperatures and increased instances of air pollution.

- Adaptive Capacity: The adaptive capacity of lower-income and institutionalized populations can be limited due to lower access to the resources necessary to prepare for or react to the long-term impacts of climate change and the increased frequency of disasters.

**Water Conservation**: Reducing water use, such as turning off taps, shortening shower times, and cutting back on outdoor irrigation.

**Water Efficiency:** Replacing older technologies and practices in order to accomplish the same results with less water, for example, by replacing toilets with new low-water-using models and by installing “smart controllers” in irrigated areas.

**Water-Efficient Landscape:** Native or low-water-using landscapes. Water-efficient landscapes are required by law in all cities and counties in California to conserve water.

**Watershed:** The total area above a given point on a watercourse that contributes water to its flow; the entire region drained by a waterway or watercourse that drains into a lake or reservoir.

**Zero Emissions Vehicle (ZEV):** A vehicle that does not emit any tailpipe emissions from the on-board source of power. Both electric and hydrogen fuel cell vehicles are classified as ZEVs.

# APPENDIX A:
# COMMUNITY 2006 GREENHOUSE GAS EMISSIONS DETAILED REPORT

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **Residential** | | | |
| **San Luis Obispo County, CA** | | | |
| *1 PG&E Residential Natural Gas* | | | |
| Natural Gas | 798 | 0.1 | 14,993 |
| *Subtotal 1 PG&E Residential Natural Gas* | 798 | 0.1 | 14,993 |

Source(s):

- All PG&E data was received from Jeremy Howard, Account Executive with PG&E.
- Data file: PG&E_2006_UNINC.xls

Notes:

- The "California Coefficients for Natural Gas" coefficient set is based on a PG&E $eCO_2$ emissions factor of 53.05 kg/MMBtu of delivered natural gas, certified by the California Climate Action Registry and the CEC, and was reported to ICLEI in December 2007 by Jasmin Ansar. Criteria air pollutant emissions factors for natural gas are derived from the EPA's annual report of air pollution emission trends (EPA 2001c).

| | | | |
|---|---|---|---|
| *1 SoCal Gas Co. Residential Natural Gas* | | | |
| Natural Gas | 70,055 | 7.6 | 1,249,665 |
| *Subtotal 1 SoCal Gas Co. Residential Natural Gas* | 70,055 | 7.6 | 1,249,665 |

Source(s):

- Southern California Gas Co data was provided by Colby Morrow, Air Quality Manager, Customer Programs Environmental Affairs.
- Data file: Gas Usage by Market (MCF).xls

Notes:

- Conversion of 1 MCF=10 therms was used.
- Default Fuel $CO_2$ Set
- CEC Emission Factor for Natural Gas – RCI Average Set

[1] Due to the rounding of decimals, the numbers provided in this appendix may not equal the totals.

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| *2 PG&E Residential Electricity* | | | |
| Electricity | 65,514 | 7.1 | 1,056,643 |
| *Subtotal 2 PG&E Residential Electricity* | 65,514 | 7.1 | 1,056,643 |

Source(s):

- All PG&E data was received from Jeremy Howard, Account Executive with PG&E.
- Data file: PG&E_2006_UNINC.xls

Notes:

- The "PG&E California" electricity coefficient set is based on the 2005 PG&E $eCO_2$ emission factor of 0.492859 lbs/kWh of delivered electricity. This emissions factor is certified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. Criteria air pollutant emission factors for electricity are derived from the NERC Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.

| | | | |
|---|---|---|---|
| **Subtotal Residential** | 136,367 | 14.9 | 2,321,301 |
| **Commercial** | | | |
| **San Luis Obispo County, CA** | | | |
| *1 PG&E Commercial + Industrial Natural Gas* | | | |
| Natural Gas | 1,144 | 0.1 | 21,506 |
| *Subtotal 1 PG&E Commercial + Industrial Natural Gas* | 1,144 | 0.1 | 21,506 |

Source(s):

- All PG&E data was received from Jeremy Howard, Account Executive with PG&E.
- Data file: PG&E_2006_UNINC.xls

Notes:

- PG&E supplies natural gas to Shandon and portions of Creston, while SoCal Gas Co. serves the rest of SLO County. Conversion of 1 MCF=10 therms was used.
- PG&E data for commercial and industrial was combined and included under commercial, due to 15/15 Rule.
- Notation: The "California Coefficients for Natural Gas" coefficient set is based on a

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|

PG&E $eCO_2$ emissions factor of 53.05 kg/MMBtu of delivered natural gas, certified by the California Climate Action Registry and the CEC, and was reported to ICLEI in December 2007 by Jasmin Ansar. Criteria air pollutant emissions factors for natural gas are derived from the EPA's annual report of air pollution emission trends (EPA 2001c).

*1 SoCal Gas Co. Commercial Natural Gas*

| | | | |
|---|---|---|---|
| Natural Gas | 72,214 | 7.9 | 1,288,177 |
| *Subtotal 1 SoCal Gas Co. Commercial Natural Gas* | 72,214 | 7.9 | 1,288,177 |

Source(s):

- Southern California Gas Co data was provided by Colby Morrow, Air Quality Manager, Customer Programs Environmental Affairs .
- Data file: Gas Usage by Market (MCF).xls

- Conversion of 1 MCF=10 therms was used.
- CEC Emission Factor for Natural Gas – RCI Average Set
- Default Fuel $CO_2$ Set

*1 SoCal Gas Co. Industrial Natural Gas*

| | | | |
|---|---|---|---|
| Natural Gas | 74,135 | 8.1 | 1,322,431 |
| *Subtotal 1 SoCal Gas Co. Industrial Natural Gas* | 74,135 | 8.1 | 1,322,431 |

Source(s):

- Southern California Gas Co data was provided by Colby Morrow, Air Quality Manager, Customer Programs Environmental Affairs .
- Data file: Gas Usage by Market (MCF).xls

Notes:

- Conversion of 1 MCF=10 therms was used.
- Default Fuel $CO_2$ Set
- CEC Emission Factor for Natural Gas – RCI Average Set

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| *2 PG&E Commercial + Industrial Electricity* | | | |
| Electricity | 68,483 | 7.5 | 1,104,531 |
| *Subtotal 2 PG&E Commercial + Industrial Electricity* | 68,483 | 7.5 | 1,104,531 |

Source(s):

- All PG&E data was received from Jeremy Howard, Account Executive with PG&E.
- Data file: PG&E_2006_UNINC.xls

Notes:

- PG&E data for commercial and industrial was combined and included under commercial, due to 15/15 Rule adopted by the CPUC to protect customer confidentiality. The 15/15 rule requires that any aggregated information provided by the utilities must be made up of at least 15 customers. A single customer's load must be less than 15% of an assigned category. If the number of customers in the complied data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened already using the 15/15 Rule, the customer must be dropped from the information provided.
- This information was provided by Corie Cheeseman, Program Manager with Pacific Gas and Electric Company - Customer Energy Efficiency .

| | | | |
|---|---|---|---|
| **Subtotal Commercial** | 215,976 | 23.5 | 3,736,644 |

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **Transportation** | | | |
| *1 On-Road VMT – Unincorporated SLO County* | | | |
| Carbon Dioxide | 365,263 | 39.8 | |
| *Subtotal 1 On-Road VMT – Unincorporated SLO County* | 365,263 | 39.8 | |

Source(s):

- All vehicle miles traveled (VMT) and transportation-related GHG emissions were provided by Fehr & Peers, January 2011.
- Individual GHGs such as carbon dioxide, methane, and nitrous oxide are converted to $CO_2e$ by multiplying the $CO_2$ emissions by a conversion factor provided by the U.S. Environmental Protection Agency of 100/95.

Notes:

- Using select link analysis, three types of vehicle trips were tracked separately for AM and PM peak periods in unincorporated San Luis Obispo County:
- Internal-Internal: Vehicle trips with both a beginning and end in unincorporated areas of the county.
- Internal-External and External-Internal: Vehicle trips that have an ending or a beginning in unincorporated San Luis Obispo County and another outside of unincorporated San Luis Obispo County.
- External-External: Vehicle trips that pass through unincorporated San Luis Obispo County.
- Using the recommendation of the Regional Target Advisory Committee (RTAC), the body responsible for Senate Bill 375 target setting, vehicle miles traveled (VMT) from trips of type 1, 2, and 3 were counted 100%, 50%, and 0% respectively toward jurisdiction-generated VMT.
- Transportation-related greenhouse gas emissions were calculated using the California Air Resources Board (CARB) Emissions Factor (EMFAC) 2007 software. EMFAC2007 provides carbon dioxide emissions according to the unique vehicle composition of each county in California.

| | | | |
|---|---|---|---|
| **Subtotal Transportation** | 365,263 | 39.8 | 3,736,644 |

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **Waste** | | | |
| **Chicago Grade** | | | |
| *3 Unincorp. SLOco Solid Waste – Chicago Grade* | | *Disposal Method – Managed Landfill* | |
| Paper Products | 4,401 | 0.5 | |
| Food Waste | 1,458 | 0.2 | |
| Plant Debris | 640 | 0.1 | |
| Wood/Textiles | 1,166 | 0.1 | |
| *Subtotal 3 Unincorp. SLOco Solid Waste – Chicago Grade* | 7,666 | 0.8 | |

Source(s):

- Total waste tonnage for unincorporated SLO County in 2006 provided by the 2006 Disposal Report prepared by San Luis Obispo County Integrated Waste Management Authority on 3/6/07, provided by Tom Martin (.
- Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study (http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097).
- Chicago Grade landfill reports a methane recovery factor of 60%. Chicago Grade total gas generated = 170.21 million cubic feet (mmcf/yr). Total gas transferred = 102.13 mmcf/yr.

Notes:

- Waste type data not collected by landfill. State average waste characterization data is used for residential, commercial, and self-haul waste.
- A weighted average methane recovery factor of 58% is used for this calculation to account for the different recovery factor of Paso Robles.

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **Cold Canyon** | | | |
| *3 Unincorp. SLOco Solid Waste – Cold Canyon* | | *Disposal Method – Managed Landfill* | |
| Paper Products | 10,712 | 1.2 | |
| Food Waste | 3,549 | 0.4 | |
| Plant Debris | 1,559 | 0.2 | |
| Wood/Textiles | 2,839 | 0.3 | |
| *Subtotal 3 Unincorp. SLOco Solid Waste – Cold Canyon* | 18,660 | 2.0 | |

Source(s):

- Total waste tonnage for unincorporated SLO County in 2006 provided by the 2006 Disposal Report prepared by San Luis Obispo County Integrated Waste Management Authority on 3/6/07, provided by Tom Martin.
- Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study (http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097).
- Cold Canyon landfill reports a methane recovery factor of 60%. Cold Canyon total gas generated = 763.1 mmcf/yr. Total gas transferred = 457.84 mmcf/yr.

Notes:

- Waste type data not collected by landfill. State average waste characterization data is used for residential, commercial, and self-haul waste.
- A weighted average methane recovery factor of 58% is used for this calculation to account for the different recovery factor of Paso Robles.

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **Paso Robles** | | | |
| *3 Unincorp. SLOco Solid Waste – Paso Robles* | | *Disposal Method – Managed Landfill* | |
| Paper Products | 2,420 | 0.3 | |
| Food Waste | 802 | 0.1 | |
| Plant Debris | 352 | 0 | |
| Wood/Textiles | 641 | 0.1 | |
| *Subtotal 3 Unincorp. SLOco Solid Waste – Paso Robles* | 4,215 | 0.5 | |

Source(s):

- Total waste tonnage for unincorporated SLO County in 2006 provided by the 2006 Disposal Report prepared by San Luis Obispo County Integrated Waste Management Authority on 3/6/07, provided by Tom Martin.
- Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study (http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097).
- Paso Robles landfill reports a methane recovery factor of 50%. Paso Robles total gas generated = 144.48 mmcf/yr. Total gas transferred = 72.24 mmcf/yr.

Notes:

- Waste type data not collected by landfill. State average waste characterization data is used for residential, commercial, and self-haul waste.
- A weighted average methane recovery factor of 58% is used for this calculation to account for the different recovery factor of Paso Robles.

| | | | |
|---|---|---|---|
| **Subtotal Waste** | 30,540 | 3.3 | |
| **Other** | | | |

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| **San Luis Obispo County, CA** | | | |
| *1 Off-Road Agricultural Equipment* | | | |
| Carbon Dioxide | 62,784 | 6.8 | |
| Nitrous Oxide | 236 | 0 | |
| Methane | 258 | 0 | |
| *Subtotal 1 Off-Road Agricultural Equipment* | 63,278 | 6.9 | |

Source(s):

- $CO_2$, $CH_4$, and $N_2O$ emissions calculated using the California Air Resources Board OFFROAD2007 modeling tool.
- The portion of agricultural land per jurisdiction in SLO County calculated by John Demartino, PMC using County GIS shape files.

Notes:

- OFFROAD aggregates off-road agricultural equipment emissions for the entire county. Emissions were separated by jurisdiction based on the proportion of agricultural land per jurisdiction. This analysis was completed using GIS shapefiles of land use patterns in the county.
- OFFROAD includes the following agricultural equipment: 2-wheel tractors, agricultural mowers, agricultural tractors, balers, combines, hydro power units, other agricultural equipment, sprayers, swathers, tillers.

| | | | |
|---|---|---|---|
| *3 – Aircraft – Oceano Airport* | | | |
| Carbon Dioxide | 0 | 0.0 | |
| Nitrous Oxide | 1 | 0.0 | |
| Methane | 5 | 0.0 | |
| *Subtotal 3 – Aircraft – Oceano Airport* | 6 | 0.0 | |

Source(s):

- The Airport Cooperative Research Program (ACRP) Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories, 2009.

Notes:

- Make and model of aircraft, engine type, and number of annual landing and takeoff

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|

operations (LTO) were provided by an engineering report prepared by the SLO Air Pollution Control District (2008). This was a special report documenting airport activity in 2007. It was assumed that no significant changes in airport operations activity levels occurred during this time interval.

- The Federal Aviation Administration's (FAA) Emissions and Dispersion Modeling System (EDMS 5.1.2) was used to calculate $CO_2$ emissions and fuel consumed with the LTO. $CH_4$ and $N_2O$ were calculated using fuel coefficients provided by the ACRP Guidebook.
- A total of 247.323.547 lbs of aviation gas (AvGas) was reported.
- A total of 0 lbs of jet fuel was reported.

*3 Agriculture Nitrogen Fertilizers*

| | | |
|---|---|---|
| Nitrous Oxide | 22,632 | 2.5 |
| *Subtotal 3 Agriculture Nitrogen Fertilizer* | 22,632 | 2.5 |

Sources:

- California Air Resources Board.(2010). International Local Government GHG Emissions Analysis Protocol. Version 1.1. http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm
- Mary Bianchi. University of California Cooperative Extension. Email and phone correspondence.
- UC Davis Agricultural & Resource Economics (2010). Outreach & Extension: Current Cost Return Studies. Retrieved http://coststudies.ucdavis.edu/current.php.
- San Luis Obispo County Department of Agriculture Weights & Measures. 2007. 2006 Annual Report. http://www.slocounty.ca.gov/Assets/AG/croprep/2006+Crop+Report.pdf

Notes:

- County-wide crop emissions. Crop data was gathered from the 2006 County Crop Report. For each crop category (i.e. Fruit and Nut, Vegetables, and Field Crops) the top three crops in acreage were identified and confirmed as appropriate with the San Luis Obispo County University of California Cooperative Extension. An average nitrogen fertilizer use for each crop was identified using University of California Cooperative Extension cost reports and the local Farm Advisor's office. A weighted average of nitrogen fertilizer was calculated for each crop category and assumed to apply to all other crop land not within the top three crops for each category. Relies on the California Air Resources Board equation for soil management emissions that was used in the statewide greenhouse inventory to calculate direct and indirect grams of $N_2O$. Fertilizer

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|

applications grams of $N_2O$ was converted into metric tons of $CO_2e$ using factors provided in the Local Government Operations Protocol Version 1.1( 2010).

- Distinctions were not made for organic farming practices per communication with Mary Bianchi and agricultural stakeholders; there is not adequate local data to make distinctions between use of fertilizer for organic and non-organic crops.
- The following crop acreages and fertilizer characteristics were used to calculate emissions in 2006. All crop acreages are from the 2006 Annual Report (San Luis Obispo County Department of Agriculture Weights & Measures 2007). Except where otherwise noted, fertilizer application rates are taken from Current Cost Return Studies produced by UC Davis Agricultural & Resource Economics.

Fruit and Nut Crops:

- Grapes: 36,493 acres, average of 25 pounds of nitrogen applied per acre.
- Avocadoes (Has): 4,526 acres, average of 120 pounds of nitrogen applied per acre. Assumption was made using data on crop practices provided by Mary Bianchi of the Cooperative Extension.
- English Walnuts: 3,107 acres, de minimis impact. Per Mary Bianchi, walnuts in the County are dry farmed and very little fertilizer is used. Therefore, no fertilizer emissions were calculated for English walnuts.
- All other fruit and nut crops: 6,623 acres, average of 35.5 pounds of nitrogen applied per acre.

Vegetables:

- Broccoli: 11,308 acres, average of 220 pounds of fertilizer applied per acre.
- Lettuce: 6,171 acres, average of 172 pounds of fertilizer applied per acre.
- Cauliflower: 2,556 acres, average of 240 pounds of fertilizer applied per acre.
- All other vegetable crops: 14,540 acres, average of 207.8 pounds of nitrogen applied per acre.

Field Crops:

- Barley: 12,500 acres, average of 50 pounds of nitrogen applied per acre. Assumption based on local crop practices.
- Grain hay: 10,300 acres, average of 41 pounds of nitrogen per acre. Assumption based on local crop practices.
- All other field crops: 7,030 acres, average of 45.9 pounds of nitrogen applied per acre.

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|
| *3 Aircraft – San Luis Obispo Regional Airport* | | | |
| Carbon Dioxide | 5 | 0.0 | |
| Nitrous Oxide | 54 | 0.0 | |
| Methane | 173 | 0.0 | |
| *Subtotal 3 Aircraft – San Luis Obispo Regional Airport* | 231 | 0.0 | |

Source(s):

- All data from 2007, APCD Airport Source Emissions Engineering Report by Courtney Ward.

Notes:

- This emission category accounts for all aircraft exhaust emissions (excluding agricultural crop dusting). The operating emissions considered were those that occur in San Luis Obispo County below 3,000 feet, the average mixing depth in the U.S., which is also the assumed inversion altitude. Data for report obtained from San Luis County Airport and Oceano Municipal Airport. Other emissions reported by APCD but not quantified here are HC (67.223) and $PM_{2.5}$ (1.094).
- Make and model of aircraft, engine type, and number of annual landing and takeoff operations (LTO) were provided by an engineering report prepared by the SLO Air Pollution Control District (2008). This was a special report documenting airport activity in 2007. It was assumed that no significant changes in airport operations activity levels occurred during this time interval.
- The Federal Aviation Administration's (FAA) emission Dispersion Modeling System (EDMS 5.1.2) was used to calculate $CO_2$ emissions and fuel consumed with the LTO. $CH_4$ and $N_2O$ were calculated using fuel coefficients provided by the ACRP Guidebook.
- A total of 3,297074.50600 lbs of aviation gas (AvGas) was reported.
- A total of 3,714,067.182 lbs of jet fuel was reported.

| | | | |
|---|---|---|---|
| *3 Heads of Cattle and Sheep* | | | |
| Methane | 83,417 | 9.1 | |
| *Subtotal 3 Heads of Cattle and Sheep* | 83,417 | 9.1 | |

Source(s):

| | Equiv $CO_2$ (tonnes)[1] | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|

- Livestock data obtained from the Department of Agriculture and reported in the Farming Operations engineering report by Courtney Ward, July 22, 2008. Cattle heads estimated to be 95,000.
- Methane emissions from enteric fermentation and manure were calculated using Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines for National Greenhouse Gas Inventories (http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_10_Ch10_Livestock.pdf).

Notes:

- $CH_4$ is attributed to the 95,000 cattle and 6,210 sheep in SLO County (2006). Since half of the sheep and half of the cattle are in-county year-round and half are here only half of the year, we will model (95,000 * 75%) = 71,250 cattle and (6,210 * 75%) = 6,457.5 sheep.
- All cows were assumed to be in the Other/Meat category of IPCC cattle categories, as SLO county does not raise cattle or calves for dairy uses. The only dairy is on the Cal Poly campus, which is not included in this Inventory. Assumption confirmed by Robert Lilley (rlilley@co.slo.ca.us), Agricultural Commissioner for the County on 3/2/09.
- Tier 1 Enteric fermentation methane emissions factor (kg $CH_4$ per head per year) for Other cattle = 53. For Sheep = 8.
- Tier 1 Manure management methane emission factor (kg per head per year) for Other cattle = 2. For sheep in temperate average temperatures (15–25 Degrees C) = 0.28
- CATTLE: (71,250 heads * 53 kg/head) + (71,250 * 2 kg/head) = 3,776,250 + 142,500 = 3,918,750 kg/year
- SHEEP: (6,457.5 * 8) + (6,457.5 * .28) = 51,660 + 1,801.1 = 53,468.1 kg/year
- TOTAL= 3,918,750 + 53,468.1= 3,972,248.1 kg/year

| | | | |
|---|---|---|---|
| **Subtotal Other** | 169,564 | 18.5 | |
| **Total** | 917,710 | 100 | 6,057,945 |

# APPENDIX B:
# COUNTY OPERATIONS 2006 GHG EMISSIONS DETAILED REPORT

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| **Buildings** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *1 Cal Fire South/North County Training* | | | | |
| Natural Gas | 1 | 0 | 16 | $– |
| *Subtotal 1 Cal Fire South/North County Training* | 1 | 0 | 16 | $– |
| *1 Child Support Services- County* | | | | |
| Natural Gas | 11 | 0.1 | 189 | $– |
| *Subtotal 1 Child Support Services- County* | 11 | 0.1 | 189 | $– |
| *1 County Building- PPD01 Oceano Airport* | | | | |
| Natural Gas | 8 | 0 | 144 | $1,992 |
| *Subtotal 1 County Building- PPD01 Oceano Airport* | 8 | 0 | 144 | $1,992 |
| *1 County Building- PT-39 1103 Toro St. HEALTH* | | | | |
| Natural Gas | 3 | 0 | 62 | $823 |
| *Subtotal 1 County Building- PT-39 1103 Toro St. HEALTH* | 3 | 0 | 62 | $823 |
| *1&2 APCD Roberto Court (4 meters)* | | | | |
| Electricity | 4 | 0 | 72 | $3,494 |
| Natural Gas | 4 | 0 | 72 | $900 |
| *Subtotal 1&2 APCD Roberto Court (4 meters)* | 8 | 0.1 | 144 | $4,394 |
| *1&2 Cal Fire Station 21 Airport* | | | | |

[1] Due to the rounding of decimals, the numbers provided in this appendix may not equal the totals.

[2] Costs for each facility or fuel type were provided, when available.

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 6 | 0 | 102 | $– |
| Natural Gas | 7 | 0 | 118 | $– |
| *Subtotal 1&2 Cal Fire Station 21 Airport* | 13 | 0.1 | 221 | $– |
| *1&2 Cal Fire Sta. 62 Avila Valley* | | | | |
| Electricity | 3 | 0 | 42 | $– |
| Natural Gas | 5 | 0 | 82 | $– |
| *Subtotal 1&2 Cal Fire Sta. 62 Avila Valley* | 7 | 0 | 124 | $– |
| *1&2 County Building DSS PA-35 Grand Ave, Arroyo Grande* | | | | |
| Electricity | 34 | 0.2 | 549 | $27,859 |
| Natural Gas | 12 | 0.1 | 209 | $2,317 |
| *Subtotal 1&2 County Building DSS PA-35 Grand Ave, Arroyo Grande* | 46 | 0.3 | 757 | $30,176 |
| *1&2 County Building PIC20 Male Jail & Female Jail* | | | | |
| Electricity | 349 | 2.1 | 5,629 | $204,980 |
| Natural Gas | 492 | 2.9 | 8,775 | $81,279 |
| *Subtotal 1&2 County Building PIC20 Male Jail & Female Jail* | 841 | 5 | 14,404 | $286,259 |
| *1&2 County Building- Cogeneration Plant* | | | | |
| Electricity | 130 | 0.8 | 2,090 | $– |
| Natural Gas | 411 | 2.4 | 7,324 | $57,389 |
| *Subtotal 1&2 County Building- Cogeneration Plant* | 540 | 3.2 | 9,414 | $57,389 |
| *1&2 County Building- DSS PB-08_9415 El Camino Atascadero* | | | | |
| Electricity | 11 | 0.1 | 177 | $9,331 |
| Natural Gas | 7 | 0 | 118 | $1,521 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 1&2 County Building- DSS PB-08_9415 El Camino Atascadero* | 18 | 0.1 | 295 | $10,852 |
| *1&2 County Building- DSS PR15_530 12th St. Paso Robles* | | | | |
| Electricity | 18 | 0.1 | 290 | $13,747 |
| Natural Gas | 2 | 0 | 35 | $533 |
| *Subtotal 1&2 County Building- DSS PR15_530 12th St. Paso Robles* | 20 | 0.1 | 325 | $14,280 |
| *1&2 County Building- DSS PT86 2975 McMillan #160 AB* | | | | |
| Electricity | 9 | 0.1 | 151 | $8,209 |
| Natural Gas | 4 | 0 | 69 | $1,025 |
| *Subtotal 1&2 County Building- DSS PT86 2975 McMillan #160 AB* | 13 | 0.1 | 220 | $9,234 |
| *1&2 County Building- PA-28 1106 E. Grand Ave AG HEALTH* | | | | |
| Electricity | 11 | 0.1 | 178 | $8,493 |
| Natural Gas | 4 | 0 | 72 | $951 |
| *Subtotal 1&2 County Building- PA-28 1106 E. Grand Ave AG HEALTH* | 15 | 0.1 | 250 | $9,444 |
| *1&2 County Building- PA-34 1092 E. Grand Ave. AG HEALTH* | | | | |
| Electricity | 2 | 0 | 38 | $2,041 |
| Natural Gas | 1 | 0 | 20 | $546 |
| *Subtotal 1&2 County Building- PA-34 1092 E. Grand Ave. AG HEALTH* | 4 | 0 | 59 | $2,587 |
| *1&2 County Building- PAC01 South County Regional Center* | | | | |
| Electricity | 6 | 0 | 97 | $3,957 |
| Natural Gas | 1 | 0 | 17 | $207 |
| *Subtotal 1&2 County Building- PAC01 South County Regional Center* | 7 | 0 | 113 | $4,164 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 5 | 0 | 75 | $3,529 |
| Natural Gas | 4 | 0 | 67 | $902 |
| *Subtotal 1&2 County Building- PAC05 Ag Commissioner Arroyo Grande* | 8 | 0 | 142 | $4,431 |
| *1&2 County Building- PB-16 3518–3556 El Camino Real HEALTH* | | | | |
| Electricity | 7 | 0 | 107 | $5,455 |
| Natural Gas | 5 | 0 | 87 | $1,326 |
| *Subtotal 1&2 County Building- PB-16 3518-3556 El Camino Real HEALTH* | 11 | 0.1 | 193 | $6,781 |
| *1&2 County Building- PB-18 DSS 9485 El Camino, Atascadero* | | | | |
| Electricity | 2 | 0 | 34 | $1,682 |
| Natural Gas | 1 | 0 | 21 | $446 |
| *Subtotal 1&2 County Building- PB-18 DSS 9485 El Camino, Atascadero* | 3 | 0 | 55 | $2,128 |
| *1&2 County Building- PB-19 Assessor/Clerk/Planning* | | | | |
| Electricity | 7 | 0 | 107 | $5,459 |
| Natural Gas | 6 | 0 | 110 | $1,794 |
| *Subtotal 1&2 County Building- PB-19 Assessor/Clerk/Planning* | 13 | 0.1 | 216 | $7,253 |
| *1&2 County Building- PB-20 3520 El Camino Real AT HEALTH* | | | | |
| Electricity | 7 | 0 | 107 | $5,417 |
| Natural Gas | 5 | 0 | 88 | $1,350 |
| *Subtotal 1&2 County Building- PB-20 3520 El Camino Real AT HEALTH* | 12 | 0.1 | 194 | $6,767 |
| *1&2 County Building- PB-21 Probation Atascadero* | | | | |
| Electricity | 3 | 0 | 52 | $2,470 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Natural Gas | 6 | 0 | 102 | $1,350 |
| *Subtotal 1&2 County Building- PB-21 Probation Atascadero* | 9 | 0.1 | 155 | $3,820 |
| *1&2 County Building- PBG01 Atascadero Hospital* | | | | |
| Electricity | 2 | 0 | 30 | $1,421 |
| Natural Gas | 18 | 0.1 | 316 | $3,838 |
| *Subtotal 1&2 County Building- PBG01 Atascadero Hospital* | 20 | 0.1 | 346 | $5,259 |
| *1&2 County Building- PEN15 Sheriff Substation Los Osos* | | | | |
| Electricity | 6 | 0 | 97 | $4,476 |
| Natural Gas | 5 | 0 | 92 | $1,216 |
| *Subtotal 1&2 County Building- PEN15 Sheriff Substation Los Osos* | 11 | 0.1 | 189 | $5,692 |
| *1&2 County Building- PIC 23 Info Services Comm Shop* | | | | |
| Electricity | 5 | 0 | 75 | $3,535 |
| Natural Gas | 3 | 0 | 53 | $773 |
| *Subtotal 1&2 County Building- PIC 23 Info Services Comm Shop* | 8 | 0 | 128 | $4,308 |
| *1&2 County Building- PIC02 Maintenance Building* | | | | |
| Electricity | 6 | 0 | 99 | $4,658 |
| Natural Gas | 6 | 0 | 105 | $1,354 |
| *Subtotal 1&2 County Building- PIC02 Maintenance Building* | 12 | 0.1 | 204 | $6,012 |
| *1&2 County Building- PIC05 Detectives Building* | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 24 | 0.1 | 388 | $17,107 |
| Natural Gas | 8 | 0 | 148 | $1,950 |
| *Subtotal 1&2 County Building- PIC05 Detectives Building* | 32 | 0.2 | 535 | $19,057 |
| *1&2 County Building- PIC07 Sheriff Storage Building* | | | | |
| Electricity | 4 | 0 | 56 | $2,618 |
| Natural Gas | 2 | 0 | 37 | $542 |
| *Subtotal 1&2 County Building- PIC07 Sheriff Storage Building* | 6 | 0 | 93 | $3,160 |
| *1&2 County Building- PIC17 Garage* | | | | |
| Electricity | 5 | 0 | 77 | $3,588 |
| Natural Gas | 6 | 0 | 112 | $1,528 |
| *Subtotal 1&2 County Building- PIC17 Garage* | 11 | 0.1 | 189 | $5,116 |
| *1&2 County Building- PIC30 Animal Services* | | | | |
| Electricity | 23 | 0.1 | 371 | $15,116 |
| Natural Gas | 89 | 0.5 | 1,589 | $16,371 |
| *Subtotal 1&2 County Building- PIC30 Animal Services* | 112 | 0.7 | 1,960 | $31,487 |
| *1&2 County Building- PIC31 Sheriff Honor Farm* | | | | |
| Electricity | 103 | 0.6 | 1,669 | $62,299 |
| Natural Gas | 255 | 1.5 | 4,542 | $43,448 |
| *Subtotal 1&2 County Building- PIC31 Sheriff Honor Farm* | 358 | 2.1 | 6,211 | $105,747 |
| *1&2 County Building- PIC35 Juvenile Services* | | | | |
| Electricity | 72 | 0.4 | 1,156 | $43,868 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Natural Gas | 84 | 0.5 | 1,495 | $15,356 |
| *Subtotal 1&2 County Building- PIC35 Juvenile Services* | 155 | 0.9 | 2,651 | $59,224 |
| *1&2 County Building- PLC03 Municipal Court Grover Beach* | | | | |
| Electricity | 4 | 0 | 70 | $3,396 |
| Natural Gas | 3 | 0 | 60 | $824 |
| *Subtotal 1&2 County Building- PLC03 Municipal Court Grover Beach* | 8 | 0 | 130 | $4,220 |
| *1&2 County Building- PLC05 Public Health Grover Beach* | | | | |
| Electricity | 3 | 0 | 50 | $2,520 |
| Natural Gas | 3 | 0 | 58 | $773 |
| *Subtotal 1&2 County Building- PLC05 Public Health Grover Beach* | 6 | 0 | 107 | $3,293 |
| *1&2 County Building- PMA09 Park Ranger Residence* | | | | |
| Electricity | 0 | 0 | 0 | $(377) |
| Propane | 0 | 0 | 6 | $1,172 |
| *Subtotal 1&2 County Building- PMA09 Park Ranger Residence* | 0 | 0 | 6 | $795 |
| *1&2 County Building- PNL02 Morro Bay Clinic* | | | | |
| Electricity | 2 | 0 | 35 | $1,712 |
| Natural Gas | 4 | 0 | 64 | $896 |
| *Subtotal 1&2 County Building- PNL02 Morro Bay Clinic* | 6 | 0 | 99 | $2,608 |
| *1&2 County Building- PPD02 Oceano Airport Residence* | | | | |
| Electricity | 1 | 0 | 10 | $281 |
| Natural Gas | 5 | 0 | 96 | $1,165 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 1&2 County Building- PPD02 Oceano Airport Residence* | 6 | 0 | 106 | $1,446 |
| *1&2 County Building- PPD12 Coastal Dunes* | | | | |
| Electricity | 29 | 0.2 | 472 | $20,020 |
| Natural Gas | 17 | 0.1 | 300 | $2,819 |
| *Subtotal 1&2 County Building- PPD12 Coastal Dunes* | 46 | 0.3 | 772 | $22,839 |
| *1&2 County Building- PR-04 1030 Vine PR HEALTH* | | | | |
| Electricity | 7 | 0 | 118 | $5,658 |
| Natural Gas | 2 | 0 | 42 | $603 |
| *Subtotal 1&2 County Building- PR-04 1030 Vine PR HEALTH* | 10 | 0.1 | 160 | $6,261 |
| *1&2 County Building- PRE31/32 Paso Robles Courts Modulars* | | | | |
| Electricity | 14 | 0.1 | 225 | $8,978 |
| Natural Gas | 3 | 0 | 57 | $808 |
| *Subtotal 1&2 County Building- PRE31/32 Paso Robles Courts Modulars* | 17 | 0.1 | 282 | $9,786 |
| *1&2 County Building- PRE33 Public Health Paso Robles* | | | | |
| Electricity | 11 | 0.1 | 174 | $8,365 |
| Natural Gas | 6 | 0 | 112 | $1,482 |
| *Subtotal 1&2 County Building- PRE33 Public Health Paso Robles* | 17 | 0.1 | 287 | $9,847 |
| *1&2 County Building- PT-111 1011 Pacific St. HEALTH* | | | | |
| Electricity | 10 | 0.1 | 158 | $7,549 |
| Natural Gas | 1 | 0 | 24 | $393 |
| *Subtotal 1&2 County Building- PT-111 1011 Pacific St. HEALTH* | 11 | 0.1 | 181 | $7,942 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *1&2 County Building- PT-20 Superior Court* | | | | |
| Electricity | 10 | 0.1 | 158 | $8,540 |
| Natural Gas | 2 | 0 | 38 | $696 |
| *Subtotal 1&2 County Building- PT-20 Superior Court* | 12 | 0.1 | 196 | $9,236 |
| *1&2 County Building- PT-65 Family Court Services* | | | | |
| Electricity | 1 | 0 | 23 | $1,042 |
| Natural Gas | 3 | 0 | 49 | $711 |
| *Subtotal 1&2 County Building- PT-65 Family Court Services* | 4 | 0 | 73 | $1,753 |
| *1&2 County Building- PT066 2191 Johnson Ave HEALTH* | | | | |
| Electricity | 49 | 0.3 | 789 | $35,613 |
| Natural Gas | 41 | 0.2 | 726 | $7,643 |
| *Subtotal 1&2 County Building- PT066 2191 Johnson Ave HEALTH* | 90 | 0.5 | 1,514 | $43,256 |
| *1&2 County Building- PT067 Heath/Ag Depts.- 2156 Sierra Way* | | | | |
| Electricity | 33 | 0.2 | 530 | $25,950 |
| Natural Gas | 9 | 0.1 | 165 | $2,131 |
| *Subtotal 1&2 County Building- PT067 Heath/Ag Depts.- 2156 Sierra Way* | 42 | 0.2 | 695 | $28,081 |
| *1&2 County Building- PTA86 Veterans Building* | | | | |
| Electricity | 17 | 0.1 | 266 | $12,387 |
| Natural Gas | 14 | 0.1 | 258 | $2,961 |
| *Subtotal 1&2 County Building- PTA86 Veterans Building* | 31 | 0.2 | 524 | $15,348 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *1&2 County Building- PTB00 Government Center* | | | | |
| Electricity | 702 | 4.2 | 11,325 | $430,446 |
| Natural Gas | 100 | 0.6 | 1,775 | $17,587 |
| *Subtotal 1&2 County Building- PTB00 Government Center* | 802 | 4.7 | 13,100 | $448,033 |
| *1&2 County Building- PTB07 General Services* | | | | |
| Electricity | 15 | 0.1 | 236 | $11,537 |
| Natural Gas | 1 | 0 | 18 | $341 |
| *Subtotal 1&2 County Building- PTB07 General Services* | 16 | 0.1 | 254 | $11,878 |
| *1&2 County Building- PTB10 Kimball Building* | | | | |
| Electricity | 17 | 0.1 | 266 | $13,172 |
| Natural Gas | 14 | 0.1 | 243 | $2,898 |
| *Subtotal 1&2 County Building- PTB10 Kimball Building* | 30 | 0.2 | 510 | $16,070 |
| *1&2 County Building- PTC91 Courts Attorneys* | | | | |
| Electricity | 5 | 0 | 84 | $3,993 |
| Natural Gas | 2 | 0 | 36 | $542 |
| *Subtotal 1&2 County Building- PTC91 Courts Attorneys* | 7 | 0 | 119 | $4,535 |
| *1&2 County Building- PTD92 Grand Jury* | | | | |
| Electricity | 2 | 0 | 26 | $1,557 |
| Natural Gas | 2 | 0 | 43 | $622 |
| *Subtotal 1&2 County Building- PTD92 Grand Jury* | 4 | 0 | 69 | $2,179 |
| *1&2 County Building- PTF53 Probation SLO* | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 25 | 0.2 | 409 | $19,470 |
| Natural Gas | 12 | 0.1 | 207 | $2,587 |
| *Subtotal 1&2 County Building- PTF53 Probation SLO* | 37 | 0.2 | 616 | $22,057 |
| *1&2 County Building- PTF66 Health Campus* | | | | |
| Electricity | 106 | 0.6 | 1,715 | $79,296 |
| Natural Gas | 87 | 0.5 | 1,556 | $15,404 |
| *Subtotal 1&2 County Building- PTF66 Health Campus* | 194 | 1.1 | 3,272 | $94,700 |
| *1&2 County Building- PTN11 Airport Terminal* | | | | |
| Electricity | 81 | 0.5 | 1,305 | $51,779 |
| Natural Gas | 12 | 0.1 | 213 | $2,769 |
| *Subtotal 1&2 County Building- PTN11 Airport Terminal* | 93 | 0.6 | 1,518 | $54,548 |
| *1&2 County Building- PTR01 DSS 3433 Higuera St.* | | | | |
| Electricity | 146 | 0.9 | 2,348 | $106,245 |
| Natural Gas | 78 | 0.5 | 1,386 | $14,634 |
| *Subtotal 1&2 County Building- PTR01 DSS 3433 Higuera St.* | 223 | 1.3 | 3,734 | $120,879 |
| *1&2 County Building- PWA06 Sheriff Templeton* | | | | |
| Electricity | 15 | 0.1 | 236 | $10,882 |
| Natural Gas | 5 | 0 | 90 | $1,268 |
| *Subtotal 1&2 County Building- PWA06 Sheriff Templeton* | 20 | 0.1 | 325 | $12,150 |
| *1&2 County Building- PWA07 Ag Commissioner Templeton* | | | | |
| Electricity | 4 | 0 | 69 | $3,285 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Natural Gas | 18 | 0.1 | 323 | $3,751 |
| *Subtotal 1&2 County Building- PWA07 Ag Commissioner Templeton* | 22 | 0.1 | 392 | $7,036 |
| *1&2 County Building- PYA09 El Chorro Maintenance* | | | | |
| Electricity | 4 | 0 | 61 | $2,844 |
| Natural Gas | 2 | 0 | 41 | $646 |
| *Subtotal 1&2 County Building- PYA09 El Chorro Maintenance* | 6 | 0 | 102 | $3,490 |
| *1&2 County Building- South County Sheriff Sub Station- 1681 Front St., Oceano* | | | | |
| Electricity | 11 | 0.1 | 178 | $8,463 |
| Natural Gas | 14 | 0.1 | 255 | $2,945 |
| *Subtotal 1&2 County Building- South County Sheriff Sub Station- 1681 Front St., Oceano* | 25 | 0.2 | 433 | $11,408 |
| *1&2 County Facility- PGF01 Swimming Pool Windsor Blvd.* | | | | |
| Electricity | 3 | 0 | 41 | $1,853 |
| Natural Gas | 5 | 0 | 81 | $886 |
| *Subtotal 1&2 County Facility- PGF01 Swimming Pool Windsor Blvd.* | 7 | 0 | 122 | $2,739 |
| *1&2 County Facility- PKC03 Hardie Park Pool* | | | | |
| Electricity | 9 | 0.1 | 149 | $6,611 |
| Natural Gas | 24 | 0.1 | 432 | $4,705 |
| *Subtotal 1&2 County Facility- PKC03 Hardie Park Pool* | 33 | 0.2 | 582 | $11,316 |
| *1&2 County Facility- PM-01 Santa Margarita RA* | | | | |
| Electricity | 29 | 0.2 | 468 | $18,171 |
| Propane | 2 | 0 | 25 | $6,896 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 1&2 County Facility- PM-01 Santa Margarita RA* | 31 | 0.2 | 493 | $25,067 |
| *1&2 County Facility- PMA01 Lopez Park* | | | | |
| Electricity | 64 | 0.4 | 1,038 | $39,934 |
| Propane | 8 | 0 | 126 | $2,204 |
| *Subtotal 1&2 County Facility- PMA01 Lopez Park* | 73 | 0.4 | 1,164 | $42,138 |
| *1&2 County Facility- PN-19 Morro Bay Golf Course* | | | | |
| Electricity | 42 | 0.2 | 680 | $24,015 |
| Propane | 1 | 0 | 15 | $1,251 |
| *Subtotal 1&2 County Facility- PN-19 Morro Bay Golf Course* | 43 | 0.3 | 695 | $25,266 |
| *1&2 County Facility- PWB09 Templeton Park* | | | | |
| Electricity | 12 | 0.1 | 201 | $8,114 |
| Natural Gas | 0 | 0 | 6 | $206 |
| *Subtotal 1&2 County Facility- PWB09 Templeton Park* | 13 | 0.1 | 207 | $8,320 |
| *1&2 County Facility- PYA04 El Chorro Park* | | | | |
| Electricity | 24 | 0.1 | 389 | $17,773 |
| Natural Gas | 5 | 0 | 98 | $1,320 |
| Propane | 6 | 0 | 90 | $1,514 |
| *Subtotal 1&2 County Facility- PYA04 El Chorro Park* | 36 | 0.2 | 577 | $20,607 |
| *1&2 County Facility- PYA11 Dairy Creek Golf Course* | | | | |
| Electricity | 54 | 0.3 | 873 | $33,588 |
| Natural Gas | 3 | 0 | 45 | $713 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 1&2 County Facility- PYA11 Dairy Creek Golf Course* | 57 | 0.3 | 918 | $34,301 |
| *1&2 County Library- Arroyo Grande* | | | | |
| Electricity | 28 | 0.2 | 448 | $15,848 |
| Natural Gas | 7 | 0 | 129 | $1,648 |
| *Subtotal 1&2 County Library- Arroyo Grande* | 35 | 0.2 | 577 | $17,496 |
| *1&2 County Library- Atascadero* | | | | |
| Electricity | 19 | 0.1 | 310 | $14,177 |
| Natural Gas | 12 | 0.1 | 216 | $2,563 |
| *Subtotal 1&2 County Library- Atascadero* | 31 | 0.2 | 526 | $16,740 |
| *1&2 County Library- Cambria* | | | | |
| Electricity | 4 | 0 | 61 | $2,664 |
| Natural Gas | 2 | 0 | 40 | $600 |
| *Subtotal 1&2 County Library- Cambria* | 6 | 0 | 101 | $3,264 |
| *1&2 County Library- Cayucos* | | | | |
| Electricity | 1 | 0 | 14 | $697 |
| Natural Gas | 4 | 0 | 63 | $835 |
| *Subtotal 1&2 County Library- Cayucos* | 4 | 0 | 77 | $1,532 |
| *1&2 County Library- Los Osos* | | | | |
| Electricity | 6 | 0 | 97 | $3,384 |
| Natural Gas | 2 | 0 | 28 | $441 |
| *Subtotal 1&2 County Library- Los Osos* | 8 | 0 | 125 | $3,825 |
| *1&2 County Library- Morro Bay* | | | | |
| Electricity | 9 | 0.1 | 147 | $6,085 |
| Natural Gas | 3 | 0 | 46 | $646 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 1&2 County Library- Morro Bay* | 12 | 0.1 | 193 | $6,731 |
| *1&2 County Library- Nipomo* | | | | |
| Electricity | 11 | 0.1 | 183 | $7,868 |
| Natural Gas | 2 | 0 | 29 | $468 |
| *Subtotal 1&2 County Library- Nipomo* | 13 | 0.1 | 211 | $8,336 |
| *1&2 County Library- San Miguel* | | | | |
| Electricity | 1 | 0 | 11 | $396 |
| Natural Gas | 0 | 0 | 5 | $168 |
| *Subtotal 1&2 County Library- San Miguel* | 1 | 0 | 16 | $564 |
| *1&2 County Library- Santa Margarita* | | | | |
| Electricity | 2 | 0 | 32 | $1,530 |
| Natural Gas | 1 | 0 | 23 | $388 |
| *Subtotal 1&2 County Library- Santa Margarita* | 3 | 0 | 55 | $1,918 |
| *2 APCD Atascadero* | | | | |
| Electricity | 3 | 0 | 51 | $2,412 |
| *Subtotal 2 APCD Atascadero* | 3 | 0 | 51 | $2,412 |
| *2 APCD Grover Beach* | | | | |
| Electricity | 0 | 0 | 1 | $149 |
| *Subtotal 2 APCD Grover Beach* | 0 | 0 | 1 | $149 |
| *2 APCD Morro Bay* | | | | |
| Electricity | 3 | 0 | 43 | $2,048 |
| *Subtotal 2 APCD Morro Bay* | 3 | 0 | 43 | $2,048 |
| *2 APCD Nipomo* | | | | |
| Electricity | 2 | 0 | 33 | $1,705 |
| *Subtotal 2 APCD Nipomo* | 2 | 0 | 33 | $1,705 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 APCD Shandon/Redhills* | | | | |
| Electricity | 1 | 0 | 23 | $1,125 |
| *Subtotal 2 APCD Shandon/Redhills* | 1 | 0 | 23 | $1,125 |
| *2 Cal Fire Sta. 14 Morro Toro* | | | | |
| Electricity | 1 | 0 | 13 | $– |
| *Subtotal 2 Cal Fire Sta. 14 Morro Toro* | 1 | 0 | 13 | $– |
| *2 Cal Fire Sta. 22 Nipomo Mesa* | | | | |
| Electricity | 4 | 0 | 58 | $– |
| *Subtotal 2 Cal Fire Sta. 22 Nipomo Mesa* | 4 | 0 | 58 | $– |
| *2 Cal Fire Sta. 33 Heritage Ranch* | | | | |
| Electricity | 5 | 0 | 73 | $– |
| *Subtotal 2 Cal Fire Sta. 33 Heritage Ranch* | 5 | 0 | 73 | $– |
| *2 Cal Fire Sta. 43 Creston* | | | | |
| Electricity | 5 | 0 | 76 | $– |
| *Subtotal 2 Cal Fire Sta. 43 Creston* | 5 | 0 | 76 | $– |
| *2 County Building- DSS PT-91 836 Via Estaban* | | | | |
| Electricity | 34 | 0.2 | 549 | $27,859 |
| *Subtotal 2 County Building- DSS PT-91 836 Via Estaban* | 34 | 0.2 | 549 | $27,859 |
| *2 County Building- PBG04 Public Health Atascadero* | | | | |
| Electricity | 24 | 0.1 | 384 | $18,098 |
| *Subtotal 2 County Building- PBG04 Public Health Atascadero* | 24 | 0.1 | 384 | $18,098 |
| *2 County Building- PIC36 Sheriff EOC Building* | | | | |
| Electricity | 27 | 0.2 | 429 | $16,486 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County Building- PIC36 Sheriff EOC Building* | 27 | 0.2 | 429 | $16,486 |
| *2 County Building- PLC02 Grover Courts Modular* | | | | |
| Electricity | 6 | 0 | 105 | $4,848 |
| *Subtotal 2 County Building- PLC02 Grover Courts Modular* | 6 | 0 | 105 | $4,848 |
| *2 County Building- POB24 Nipomo Park Host* | | | | |
| Electricity | 3 | 0 | 55 | $4,126 |
| *Subtotal 2 County Building- POB24 Nipomo Park Host* | 3 | 0 | 55 | $4,126 |
| *2 County Building- PPD01 Oceano Airport Hangars* | | | | |
| Electricity | 5 | 0 | 86 | $2,498 |
| *Subtotal 2 County Building- PPD01 Oceano Airport Hangars* | 5 | 0 | 86 | $2,498 |
| *2 County Building- PT-101 2995 McMillan Ave HEALTH* | | | | |
| Electricity | 3 | 0 | 43 | $2,245 |
| *Subtotal 2 County Building- PT-101 2995 McMillan Ave HEALTH* | 3 | 0 | 43 | $2,245 |
| *2 County Building- PT-102 2945 McMillan Ave HEALTH* | | | | |
| Electricity | 19 | 0.1 | 300 | $14,097 |
| *Subtotal 2 County Building- PT-102 2945 McMillan Ave HEALTH* | 19 | 0.1 | 300 | $14,097 |
| *2 County Building- PT-110 3183 Duncan Ave HEALTH* | | | | |
| Electricity | 7 | 0 | 111 | $5,354 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County Building- PT-110 3183 Duncan Ave HEALTH* | 7 | 0 | 111 | $5,354 |
| *2 County Building- PT-20 Info Tech Ahern Building* | | | | |
| Electricity | 3 | 0 | 50 | $1,971 |
| *Subtotal 2 County Building- PT-20 Info Tech Ahern Building* | 3 | 0 | 50 | $1,971 |
| *2 County Building- PT-40 2925 McMillan Ave HEALTH* | | | | |
| Electricity | 0 | 0 | 2 | $117 |
| *Subtotal 2 County Building- PT-40 2925 McMillan Ave HEALTH* | 0 | 0 | 2 | $117 |
| *2 County Building- PT-48 Public Health Lab Bishop* | | | | |
| Electricity | 0 | 0 | 4 | $179 |
| *Subtotal 2 County Building- PT-48 Public Health Lab Bishop* | 0 | 0 | 4 | $179 |
| *2 County Building- PT-68 District Attorney* | | | | |
| Electricity | 0 | 0 | 7 | $363 |
| Natural Gas | 0 | 0 | 0 | $137 |
| *Subtotal 2 County Building- PT-68 District Attorney* | 0 | 0 | 7 | $500 |
| *2 County Building- PTB11 Kimball Building East Lot* | | | | |
| Electricity | 6 | 0 | 99 | $4,589 |
| *Subtotal 2 County Building- PTB11 Kimball Building East Lot* | 6 | 0 | 99 | $4,589 |
| *2 County Building- PTN10 Airport Hangars* | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 3 | 0 | 52 | $2,576 |
| *Subtotal 2 County Building- PTN10 Airport Hangars* | 3 | 0 | 52 | $2,576 |
| *2 County Building- PTN10 Airport Large Hangar* | | | | |
| Electricity | 0 | 0 | 2 | $210 |
| *Subtotal 2 County Building- PTN10 Airport Large Hangar* | 0 | 0 | 2 | $210 |
| *2 County Building- PTN10 Airport Maintenance Building* | | | | |
| Electricity | 0 | 0 | 0 | $50 |
| *Subtotal 2 County Building- PTN10 Airport Maintenance Building* | 0 | 0 | 0 | $50 |
| *2 County Building- PTN10 Airport Multi Hangar* | | | | |
| Electricity | 4 | 0 | 61 | $3,091 |
| *Subtotal 2 County Building- PTN10 Airport Multi Hangar* | 4 | 0 | 61 | $3,091 |
| *2 County Building- PTN10 Airport- Maintenance Bldg* | | | | |
| Electricity | 7 | 0 | 120 | $5,633 |
| *Subtotal 2 County Building- PTN10 Airport- Maintenance Bldg* | 7 | 0 | 120 | $5,633 |
| *2 County Building- PUG24 Rio Caledonia Adobe* | | | | |
| Electricity | 8 | 0 | 123 | $3,982 |
| *Subtotal 2 County Building- PUG24 Rio Caledonia Adobe* | 8 | 0 | 123 | $3,982 |
| *2 County Building- PY03 Rocky Butte* | | | | |
| Electricity | 8 | 0 | 136 | $6,310 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County Building- PY03 Rocky Butte* | 8 | 0 | 136 | $6,310 |
| *2 County Building- RKE 1170 Marsh St.* | | | | |
| Electricity | 1 | 0 | 18 | $909 |
| *Subtotal 2 County Building- RKE 1170 Marsh St.* | 1 | 0 | 18 | $909 |
| *2 County Facility- PBF01 Heilmann Regional Park* | | | | |
| Electricity | 3 | 0 | 44 | $2,396 |
| *Subtotal 2 County Facility- PBF01 Heilmann Regional Park* | 3 | 0 | 44 | $2,396 |
| *2 County Facility- PDA01 Bob Jones Bike Trail* | | | | |
| Electricity | 0 | 0 | 1 | $64 |
| *Subtotal 2 County Facility- PDA01 Bob Jones Bike Trail* | 0 | 0 | 1 | $64 |
| *2 County Facility- PDA07 Avila Beach Park* | | | | |
| Electricity | 1 | 0 | 19 | $951 |
| *Subtotal 2 County Facility- PDA07 Avila Beach Park* | 1 | 0 | 19 | $951 |
| *2 County Facility- PEN02 Los Osos Park* | | | | |
| Electricity | 5 | 0 | 81 | $3,041 |
| *Subtotal 2 County Facility- PEN02 Los Osos Park* | 5 | 0 | 81 | $3,041 |
| *2 County Facility- PGC01 Shamel Park* | | | | |
| Electricity | 1 | 0 | 11 | $705 |
| *Subtotal 2 County Facility- PGC01 Shamel Park* | 1 | 0 | 11 | $705 |
| *2 County Facility- PJB02 Paul Andrews Park* | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 0 | 0 | 0 | $96 |
| *Subtotal 2 County Facility- PJB02 Paul Andrews Park* | 0 | 0 | 0 | $96 |
| *2 County Facility- PJB04 Cayucos Pier* | | | | |
| Electricity | 1 | 0 | 19 | $1,372 |
| *Subtotal 2 County Facility- PJB04 Cayucos Pier* | 1 | 0 | 19 | $1,372 |
| *2 County Facility- PKC01 Hardie Park* | | | | |
| Electricity | 1 | 0 | 11 | $680 |
| *Subtotal 2 County Facility- PKC01 Hardie Park* | 1 | 0 | 11 | $680 |
| *2 County Facility- POB20 Nipomo Park* | | | | |
| Electricity | 9 | 0.1 | 146 | $7,024 |
| *Subtotal 2 County Facility- POB20 Nipomo Park* | 9 | 0.1 | 146 | $7,024 |
| *2 County Facility- PPB28 Campground Oceano* | | | | |
| Electricity | 14 | 0.1 | 231 | $6,435 |
| *Subtotal 2 County Facility- PPB28 Campground Oceano* | 14 | 0.1 | 231 | $6,435 |
| *2 County Facility- PPB29 Park Oceano* | | | | |
| Electricity | 1 | 0 | 21 | $721 |
| *Subtotal 2 County Facility- PPB29 Park Oceano* | 1 | 0 | 21 | $721 |
| *2 County Facility- PPD01 Oceano Airport Runway Lights* | | | | |
| Electricity | 6 | 0 | 95 | $3,130 |
| *Subtotal 2 County Facility- PPD01 Oceano Airport Runway Lights* | 6 | 0 | 95 | $3,130 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 County Facility- PTJ00 Cuesta Park* | | | | |
| Electricity | 0 | 0 | 2 | $193 |
| *Subtotal 2 County Facility- PTJ00 Cuesta Park* | 0 | 0 | 2 | $193 |
| *2 County Facility- PTN10 Airport* | | | | |
| Electricity | 17 | 0.1 | 272 | $8,616 |
| *Subtotal 2 County Facility- PTN10 Airport* | 17 | 0.1 | 272 | $8,616 |
| *2 County Facility- PTN10 Airport Restaurants/Lights* | | | | |
| Electricity | 2 | 0 | 32 | $1,421 |
| *Subtotal 2 County Facility- PTN10 Airport Restaurants/Lights* | 2 | 0 | 32 | $1,421 |
| *2 County Facility- PTN10 Airport Runway Lights* | | | | |
| Electricity | 49 | 0.3 | 795 | $27,045 |
| *Subtotal 2 County Facility- PTN10 Airport Runway Lights* | 49 | 0.3 | 795 | $27,045 |
| *2 County Facility- PTN10 Airport Sign* | | | | |
| Electricity | 0 | 0 | 5 | $315 |
| *Subtotal 2 County Facility- PTN10 Airport Sign* | 0 | 0 | 5 | $315 |
| *2 County Facility- PTN10 Airport Streetlights* | | | | |
| Electricity | 4 | 0 | 61 | $3,867 |
| *Subtotal 2 County Facility- PTN10 Airport Streetlights* | 4 | 0 | 61 | $3,867 |
| *2 County Facility- PTN10 Airport Wind Cone* | | | | |
| Electricity | 1 | 0 | 15 | $872 |
| *Subtotal 2 County Facility- PTN10 Airport Wind Cone* | 1 | 0 | 15 | $872 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 County Facility- PUD15 Swimming Pool K St.* | | | | |
| Electricity | 11 | 0.1 | 171 | $6,642 |
| *Subtotal 2 County Facility- PUD15 Swimming Pool K St.* | 11 | 0.1 | 171 | $6,642 |
| *2 County Facility- PUE13 San Miguel Park* | | | | |
| Electricity | 0 | 0 | 5 | $336 |
| *Subtotal 2 County Facility- PUE13 San Miguel Park* | 0 | 0 | 5 | $336 |
| *2 County Facility- PVA04 Park H St.* | | | | |
| Electricity | 0 | 0 | 3 | $217 |
| *Subtotal 2 County Facility- PVA04 Park H St.* | 0 | 0 | 3 | $217 |
| *2 County Facility- PY-02 Black Mountain* | | | | |
| Electricity | 6 | 0 | 94 | $4,349 |
| *Subtotal 2 County Facility- PY-02 Black Mountain* | 6 | 0 | 94 | $4,349 |
| *2 County Facility- PY01 Cuesta Peak* | | | | |
| Electricity | 5 | 0 | 88 | $4,144 |
| *Subtotal 2 County Facility- PY01 Cuesta Peak* | 5 | 0 | 88 | $4,144 |
| *2 County Facility- PY05 San Antonio/Casmalia Peak* | | | | |
| Electricity | 5 | 0 | 76 | $3,564 |
| *Subtotal 2 County Facility- PY05 San Antonio/Casmalia Peak* | 5 | 0 | 76 | $3,564 |
| *2 County Facility- PY08 Tassajara Peak* | | | | |
| Electricity | 12 | 0.1 | 201 | $9,450 |
| *Subtotal 2 County Facility- PY08 Tassajara Peak* | 12 | 0.1 | 201 | $9,450 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 County Facility- PYA01 Biddle Park* | | | | |
| Electricity | 6 | 0 | 90 | $4,221 |
| *Subtotal 2 County Facility- PYA01 Biddle Park* | 6 | 0 | 90 | $4,221 |
| *2 County Facility- PZB06 Shandon Park* | | | | |
| Electricity | 17 | 0.1 | 276 | $9,823 |
| *Subtotal 2 County Facility- PZB06 Shandon Park* | 17 | 0.1 | 276 | $9,823 |
| *2 County Library- Creston* | | | | |
| Electricity | 1 | 0 | 23 | $706 |
| *Subtotal 2 County Library- Creston* | 1 | 0 | 23 | $706 |
| *2 County Library- San Luis Obispo* | | | | |
| Electricity | 31 | 0.2 | 506 | $12,755 |
| *Subtotal 2 County Library- San Luis Obispo* | 31 | 0.2 | 506 | $12,755 |
| *2 Public Works- 1015 Kansas Ave. SLO* | | | | |
| Electricity | 0 | 0 | 0 | $– |
| *Subtotal 2 Public Works- 1015 Kansas Ave. SLO* | 0 | 0 | 0 | $– |
| *2 Public Works- Arroyo Grande Rd. Yard* | | | | |
| Electricity | 5 | 0 | 74 | $– |
| *Subtotal 2 Public Works- Arroyo Grande Rd. Yard* | 5 | 0 | 74 | $– |
| *2 Public Works- House at Salinas Dam* | | | | |
| Electricity | 3 | 0 | 43 | $– |
| *Subtotal 2 Public Works- House at Salinas Dam* | 3 | 0 | 43 | $– |
| *2 Public Works- Op Center, SLO* | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| Electricity | 16 | 0.1 | 259 | $– |
| *Subtotal 2 Public Works- Op Center, SLO* | 16 | 0.1 | 259 | $– |
| *2 Public Works- Paso Robles Rd. Yard* | | | | |
| Electricity | 8 | 0 | 123 | $– |
| *Subtotal 2 Public Works- Paso Robles Rd. Yard* | 8 | 0 | 123 | $– |
| *2 Public Works- Santa Margarita Maint. Yard* | | | | |
| Electricity | 3 | 0 | 52 | $– |
| *Subtotal 2 Public Works- Santa Margarita Maint. Yard* | 3 | 0 | 52 | $– |
| *2 Public Works- Section 3 Road Yard, SLO* | | | | |
| Electricity | 7 | 0 | 115 | $– |
| *Subtotal 2 Public Works- Section 3 Road Yard, SLO* | 7 | 0 | 115 | $– |
| *2 Public Works- South Bay Dial-a-Ride Office* | | | | |
| Electricity | 1 | 0 | 21 | $– |
| *Subtotal 2 Public Works- South Bay Dial-a-Ride Office* | 1 | 0 | 21 | $– |
| *2 Public Works- Trailer Office, 2285 Turri Rd. Los Osos* | | | | |
| Electricity | 0 | 0 | 0 | $– |
| *Subtotal 2 Public Works- Trailer Office, 2285 Turri Rd. Los Osos* | 0 | 0 | 0 | $- |
| *2 Public Works- Trailer, Carrisa Plains* | | | | |
| Electricity | 0 | 0 | 7 | $– |
| *Subtotal 2 Public Works- Trailer, Carrisa Plains* | 0 | 0 | 7 | $– |
| **Subtotal Buildings** | 4,972 | 29.5 | 83,606 | $2,171,989 |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| **Vehicle Fleet** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *1 APCD Fleet* | | | | |
| Gasoline | 22 | 0.1 | 286 | $– |
| *Subtotal 1 APCD Fleet* | 22 | 0.1 | 286 | $– |
| *1 Cal Fire (County) Fleet* | | | | |
| Gasoline | 18 | 0.1 | 230 | $– |
| Diesel | 81 | 0.5 | 1,033 | $– |
| *Subtotal 1 Cal Fire (County) Fleet* | 99 | 0.6 | 1,263 | $– |
| *1 County Fleet (General Services)* | | | | |
| Gasoline | 3,014 | 17.9 | 38,877 | $– |
| Diesel | 148 | 0.9 | 1,874 | $– |
| *Subtotal 1 County Fleet (General Services)* | 3,162 | 18.7 | 40,751 | $– |
| *1 Library Fleet* | | | | |
| Gasoline | 22 | 0.1 | 286 | $6,979 |
| Diesel | 58 | 0.3 | 739 | $6,379 |
| *Subtotal 1 Library Fleet* | 80 | 0.5 | 1,025 | $13,358 |
| **Subtotal Vehicle Fleet** | 3,363 | 19.9 | 43,325 | $13,358 |
| **Employee Commute** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *3 Employee Commute* | | | | |
| Gasoline | 7,712 | 45.7 | 109,320 | n/a |
| Diesel | 88 | 0.5 | 1,046 | n/a |
| *Subtotal 3 Employee Commute* | 7,801 | 46.2 | 110,366 | n/a |
| **Subtotal Employee Commute** | 7,801 | 46.2 | 110,366 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| **Streetlights** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *2 County Streetlights* | | | | |
| Electricity | 48 | 0.3 | 777 | n/a |
| *Subtotal 2 County Streetlights* | 48 | 0.3 | 777 | n/a |
| *2 County Traffic Signals* | | | | |
| Electricity | 15 | 0.1 | 240 | n/a |
| *Subtotal 2 County Traffic Signals* | 15 | 0.1 | 240 | n/a |
| **Subtotal Streetlights** | 63 | 0.4 | 1,017 | n/a |
| **Water/Sewage** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *2 County Water Facility- 1675 Cabrillo, Cayucos Water Treatment Plant* | | | | |
| Electricity | 52 | 0.3 | 833 | n/a |
| *Subtotal 2 County Water Facility- 1675 Cabrillo, Cayucos Water Treatment Plant* | 52 | 0.3 | 833 | n/a |
| *2 County Water Facility- 2845 Lopez Dr.* | | | | |
| Electricity | 1 | 0 | 15 | n/a |
| *Subtotal 2 County Water Facility- 2845 Lopez Dr.* | 1 | 0 | 15 | n/a |
| *2 County Water Facility- 9825 Estrada Santa Margarita* | | | | |
| Electricity | 11 | 0.1 | 175 | n/a |
| *Subtotal 2 County Water Facility- 9825 Estrada Santa Margarita* | 11 | 0.1 | 175 | n/a |
| *2 County Water Facility- Frady Rd Rectifier* | | | | |
| Electricity | 0 | 0 | 2 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County Water Facility- Frady Rd Rectifier* | 0 | 0 | 2 | n/a |
| *2 County Water Facility- G St., Santa Margarita Pump* | | | | |
| Electricity | 10 | 0.1 | 164 | n/a |
| *Subtotal 2 County Water Facility- G St., Santa Margarita Pump* | 10 | 0.1 | 164 | n/a |
| *2 County Water Facility- Hwy 101 Pump* | | | | |
| Electricity | 139 | 0.8 | 2,235 | n/a |
| *Subtotal 2 County Water Facility- Hwy 101 Pump* | 139 | 0.8 | 2,235 | n/a |
| *2 County Water Facility- Lopez Dam Intake Bldg* | | | | |
| Electricity | 0 | 0 | 3 | n/a |
| *Subtotal 2 County Water Facility- Lopez Dam Intake Bldg* | 0 | 0 | 3 | n/a |
| *2 County Water Facility- Lopez Dam, 4304 Lopez Dr.* | | | | |
| Electricity | 0 | 0 | 7 | n/a |
| *Subtotal 2 County Water Facility- Lopez Dam, 4304 Lopez Dr.* | 0 | 0 | 7 | n/a |
| *2 County Water Facility- Meter Station, Bello* | | | | |
| Electricity | 0 | 0 | 0 | n/a |
| *Subtotal 2 County Water Facility- Meter Station, Bello* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Meter Station, Brisco Rd.* | | | | |
| Electricity | 0 | 0 | 0 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County Water Facility- Meter Station, Brisco Rd.* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Meter Station, Crown Hill & Huasna* | | | | |
| Electricity | 0 | 0 | 0 | n/a |
| *Subtotal 2 County Water Facility- Meter Station, Crown Hill & Huasna* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Meter Station, Oak Park Blvd* | | | | |
| Electricity | 1 | 0 | 23 | n/a |
| *Subtotal 2 County Water Facility- Meter Station, Oak Park Blvd* | 1 | 0 | 23 | n/a |
| *2 County Water Facility- Meter Station, Vista Del Mar* | | | | |
| Electricity | 0 | 0 | 0 | n/a |
| *Subtotal 2 County Water Facility- Meter Station, Vista Del Mar* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Orcutt Rd North of Lopez Dr.* | | | | |
| Electricity | 0 | 0 | 0 | n/a |
| *Subtotal 2 County Water Facility- Orcutt Rd North of Lopez Dr.* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Pozo Rd Pump* | | | | |
| Electricity | 6 | 0 | 99 | n/a |
| *Subtotal 2 County Water Facility- Pozo Rd Pump* | 6 | 0 | 99 | n/a |
| *2 County Water Facility- Pump House, Cayucos* | | | | |
| Electricity | 0 | 0 | 2 | n/a |
| *Subtotal 2 County Water Facility- Pump House, Cayucos* | 0 | 0 | 2 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 County Water Facility- Pump Well, Center St., Shandon* | | | | |
| Electricity | 9 | 0.1 | 140 | n/a |
| *Subtotal 2 County Water Facility- Pump Well, Center St., Shandon* | 9 | 0.1 | 140 | n/a |
| *2 County Water Facility- Reservoir Panel, Park Ave., Cayucos* | | | | |
| Electricity | 0 | 0 | 0 | n/a |
| *Subtotal 2 County Water Facility- Reservoir Panel, Park Ave., Cayucos* | 0 | 0 | 0 | n/a |
| *2 County Water Facility- Turri Rd Monitoring Equipment* | | | | |
| Electricity | 9 | 0.1 | 153 | n/a |
| *Subtotal 2 County Water Facility- Turri Rd Monitoring Equipment* | 9 | 0.1 | 153 | n/a |
| *2 County Water Facility- Water Tank Pipeline, Kings Ave., Morro Bay* | | | | |
| Electricity | 0 | 0 | 2 | n/a |
| *Subtotal 2 County Water Facility- Water Tank Pipeline, Kings Ave., Morro Bay* | 0 | 0 | 2 | n/a |
| *2 County Water Facility- Water Well, Cabrillo Ave., Cayucos* | | | | |
| Electricity | 2 | 0 | 28 | n/a |
| *Subtotal 2 County Water Facility- Water Well, Cabrillo Ave., Cayucos* | 2 | 0 | 28 | n/a |
| *2 County Water Facility- Well #3, Shandon* | | | | |
| Electricity | 10 | 0.1 | 167 | n/a |
| *Subtotal 2 County Water Facility- Well #3, Shandon* | 10 | 0.1 | 167 | n/a |
| *2 County WW Facility- 2167 Ridge Rider Rd. Treatment Ponds* | | | | |
| Electricity | 22 | 0.1 | 354 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County WW Facility- 2167 Ridge Rider Rd. Treatment Ponds* | 22 | 0.1 | 354 | n/a |
| *2 County WW Facility- 2176 Ridge Rider Rd. Treatment Plant* | | | | |
| Electricity | 8 | 0 | 131 | n/a |
| *Subtotal 2 County WW Facility- 2176 Ridge Rider Rd. Treatment Plant* | 8 | 0 | 131 | n/a |
| *2 County WW Facility- Crestmont Lift Pump* | | | | |
| Electricity | 1 | 0 | 16 | n/a |
| *Subtotal 2 County WW Facility- Crestmont Lift Pump* | 1 | 0 | 16 | n/a |
| *2 County WW Facility- Galaxy, Nipomo, Sewer Pump* | | | | |
| Electricity | 4 | 0 | 69 | n/a |
| *Subtotal 2 County WW Facility- Galaxy, Nipomo, Sewer Pump* | 4 | 0 | 69 | n/a |
| *2 County WW Facility- Greystone Sewer Treatment Plant* | | | | |
| Electricity | 70 | 0.4 | 1,132 | n/a |
| *Subtotal 2 County WW Facility- Greystone Sewer Treatment Plant* | 70 | 0.4 | 1,132 | n/a |
| *2 County WW Facility- Kathy Lift Pump* | | | | |
| Electricity | 3 | 0 | 42 | n/a |
| *Subtotal 2 County WW Facility- Kathy Lift Pump* | 3 | 0 | 42 | n/a |
| *2 County WW Facility- Lift Station #1, Oakshores* | | | | |
| Electricity | 0 | 0 | 2 | n/a |
| *Subtotal 2 County WW Facility- Lift Station #1, Oakshores* | 0 | 0 | 2 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *2 County WW Facility- Lift Station #2, Oakshores* | | | | |
| Electricity | 1 | 0 | 9 | n/a |
| *Subtotal 2 County WW Facility- Lift Station #2, Oakshores* | 1 | 0 | 9 | n/a |
| *2 County WW Facility- Lift Station #4, Oakshores* | | | | |
| Electricity | 0 | 0 | 3 | n/a |
| *Subtotal 2 County WW Facility- Lift Station #4, Oakshores* | 0 | 0 | 3 | n/a |
| *2 County WW Facility- Lift Station #5, Oakshores* | | | | |
| Electricity | 0 | 0 | 4 | n/a |
| *Subtotal 2 County WW Facility- Lift Station #5, Oakshores* | 0 | 0 | 4 | n/a |
| *2 County WW Facility- Lift Station #6, Oakshores* | | | | |
| Electricity | 0 | 0 | 4 | n/a |
| *Subtotal 2 County WW Facility- Lift Station #6, Oakshores* | 0 | 0 | 4 | n/a |
| *2 County WW Facility- Los Ranchos Lift Station* | | | | |
| Electricity | 5 | 0 | 78 | n/a |
| *Subtotal 2 County WW Facility- Los Ranchos Lift Station* | 5 | 0 | 78 | n/a |
| *2 County WW Facility- Madbury Lift Pump* | | | | |
| Electricity | 2 | 0 | 37 | n/a |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| *Subtotal 2 County WW Facility- Madbury Lift Pump* | 2 | 0 | 37 | n/a |
| *2 County WW Facility- Oakshores Disposal Area* | | | | |
| Electricity | 32 | 0.2 | 523 | n/a |
| *Subtotal 2 County WW Facility- Oakshores Disposal Area* | 32 | 0.2 | 523 | n/a |
| *2 County WW Facility- Oakshores Effluent Pumps* | | | | |
| Electricity | 8 | 0 | 128 | n/a |
| *Subtotal 2 County WW Facility- Oakshores Effluent Pumps* | 8 | 0 | 128 | n/a |
| *2 County WW Facility- Sebastian Way Sewer Pump, Nipomo* | | | | |
| Electricity | 5 | 0 | 75 | n/a |
| *Subtotal 2 County WW Facility- Sebastian Way Sewer Pump, Nipomo* | 5 | 0 | 75 | n/a |
| **Subtotal Water/Sewage** | 413 | 2.4 | 6,659 | n/a |
| **Waste** | | | | |
| **San Luis Obispo County, CA** | | | | |
| *County Solid Waste* | *Disposal Method - Managed Landfill* | | | |
| Paper Products | 152 | 0.9 | 0 | |
| Food Waste | 50 | 0.3 | 0 | |
| Plant Debris | 22 | 0.1 | 0 | |
| Wood/Textiles | 40 | 0.2 | 0 | |
| *Subtotal County Solid Waste* | 265 | 1.6 | 0 | n/a |
| **Subtotal Waste** | 265 | 1.6 | 0 | n/a |
| **Other** | | | | |

| | Equiv $CO_2$[1] (Tonnes) | Equiv $CO_2$ (%) | Energy (MMBtu) | Cost($)[2] |
|---|---|---|---|---|
| **San Luis Obispo County, CA** | | | | |
| *1 Misc. Equipment- Golf Course Facilities* | | | | |
| Nitrous Oxide | 1 | 0 | n/a | n/a |
| *Subtotal 1 Misc. Equipment- Golf Course Facilities* | 1 | 0 | | |
| *1 Misc. Equipment- Park Facilities* | | | | |
| Nitrous Oxide | 0 | 0 | n/a | n/a |
| *Subtotal 1 Misc. Equipment- Park Facilities* | 0 | 0 | | |
| *1 Misc. Equipment- Unknown gen. services equipment* | | | | |
| Nitrous Oxide | 1 | 0 | n/a | n/a |
| *Subtotal 1 Misc. Equipment- Unknown gen. services equipment* | 1 | 0 | | |
| | | | n/a | n/a |
| **Subtotal Other** | 2 | 0 | n/a | n/a |
| **Total** | 16,879 | 100 | 244,972 | $2,185,347 |

# APPENDIX C:
# COMMUNITY-WIDE GHG REDUCTION MEASURE TECHNICAL APPENDIX

## 1: Energy Conservation Programs

Measure:
Collaborate with local utility providers, educational institutions, and stakeholders to develop effective energy conservation campaigns through energy competitions and to provide targeted marketing for new and existing conservation programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | -860 | 1% of population voluntarily conserve 10% of energy use.<br>0.5% of large commercial facilities retrocommissioned. |
| 2020 Reductions (MTCO2e): | -2,870 | 5% household participation and 1% business participation in energy competition program.<br>1% of population voluntarily conserve 10% of energy use.<br>5% of large commercial facilities retrocommissioned. |
| 2035 Reductions (MTCO2e): | -4,100 | 5% household participation and 1% business participation in energy competition program.<br>1% of population voluntarily conserve 10% of energy use.<br>10% of large commercial facilities retrocommissioned. |

Assumptions:

Reductions in energy consumption will rely on voluntary public participation in energy conservation programs and actions to conserve energy. Participation rates are based on case studies from similar conservation programs.

Sources:

California Polytechnic State University Administration and Finance Division. 2010. Green Campus Program – Current Projects. http://www.afd.calpoly.edu/greencampus/projects.asp.

Council of Neighborhood Associations. 2011. Tallahassee – Leon County Energy Challenge. http://www.econa.org/econa/page.html?page_id=34.

Pacific Gas and Electric Company. 2011. Retrocommissioning (RCx) Program. http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/retrocommissioning/.

Sacramento Metropolitan Air Quality Management District. 2009. Spare the Air Control Measure Program; Revision to State Implementation Plan Staff Report. http://www.airquality.org/notices/CAPUpdate/STA-revisiontoSIP-StaffRpt23April2009.pdf.

## 2: Low-Income Weatherization

Measure:
Promote existing low-income energy conservation and weatherization programs and coordinate with

local utility providers and nonprofit corporations to develop additional energy efficiency programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -1,120 | 75 households retrofitted annually.<br>750 households retrofitted by 2020. |
| 2035 Reductions (MTCO2e): | -2,760 | 75 households retrofitted annually.<br>1875 households retrofitted by 2035. |

Assumptions:
The anticipated number of low-income households retrofitted is based on the percentage of households retrofitted statewide and applied to San Luis Obispo County. The average energy savings per household comes from the State of California Department of Community Services and Development.
Sources:
State of California Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf.

State of California Department of Finance. 2010. E-2 California County Population Estimates and Components of Change by Year. http://www.dof.ca.gov/research/demographic/reports/view.php#objCollapsiblePanelEstimatesAnchor.

### 3: Energy Efficiency Financing

Measure:
Develop and adopt an energy efficiency retrofit program to increase energy efficiency in existing commercial, residential, governmental, and industrial facilities.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -11,430 | 15% of households and 10% of businesses participating.<br>Average electricity savings of 10%.<br>Average natural gas savings of 25%. |
| 2035 Reductions (MTCO2e): | -13,410 | 25% of households and 15% of businesses participating.<br>Average electricity savings of 10%.<br>Average natural gas savings of 25%. |

Assumptions:
Participation in energy efficiency financing programs and the average energy savings per participant is based on program evaluations and research of existing programs in other jurisdictions.
Sources:

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative. 2010. Property Assessed Clean Energy Programs White Paper.

San Luis Obispo County. 2009. San Luis Obispo County General Plan: Housing Element. Planning and Building, San Luis Obispo, CA.

## 4: Energy Efficiency in Existing Buildings

Measure:
The County will collaborate with the incorporated cities in the county to develop and implement a countywide program to: 1) conduct energy audits or provide EPA Home Energy Scores for residential buildings; 2) disclose energy use history of non-residential buildings; and 3) prepare an energy conservation ordinance to reduce electricity and natural gas use by implementing energy efficiency measures identified in the energy audits.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -9,580 | 3,200 residential units audited and 16% of nonresidential properties audited.<br>20% average energy savings per residential building and 25% for nonresidential buildings. |
| 2035 Reductions (MTCO2e): | -29,250 | 8,000 residential units audited and 46% of nonresidential properties audited.<br>20% average energy savings per residential building and 25% for nonresidential buildings. |

Assumptions:
Participation in the program is estimated at 3,200 residential units by 2020 and 8,000 units by 2035. Energy savings per building will be identified within the program/ordinance guidelines at the time of adoption.
Sources:
California Energy Commission. 2010. Nonresidential Building Energy Performance Rating Disclosure Regulations. Sacramento.

U.S. Department of Energy. 2011. Energy Efficiency and Renewable Energy. Home Energy Score. http://www1.eere.energy.gov/buildings/homeenergyscore/.

## 5: Workforce Training Programs

Measure:
Continue to seek funding and support green building and weatherization training programs like the SLO County Workforce Investment Board's program funded by the California Clean Energy Workforce Training Program.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|

| | | |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantifiable | 200 participants trained |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantifiable | 1,000 participants trained |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantifiable | 1,500 participants trained |

Assumptions:
The SLO County Workforce Investment Board has estimated that it will train 200 participants through the initial Green Building and Clean Energy Training Program. It is estimated that the County and its partners will continue to apply for funding to expand the program to train 1,000 participants by 2020 and a total of 1,500 participants by 2035.
Sources:
Workforce Investment Board San Luis Obispo County. 2009. Green Jobs Program. SLO County Receives Green Jobs Grant of $610,055. http://sloworkforce.com/wordpress/projects/green-jobs-program/.

## 6: Smart Grid Technology

Measure:
Work with local utility providers to implement smart grid technology in new and existing residential and nonresidential properties.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -7,930 | 50% of homes and businesses utilizing energy monitors |
| 2035 Reductions (MTCO2e): | -13,180 | 80% of homes and businesses utilizing energy monitors |

Assumptions:
Smart grid integration will reduce energy demand through continuous feedback of real-time energy use. Research has shown that the more frequently building users are reminded of their energy use, the more they will change their behaviors to consume less energy. Additional energy savings will be achieved through the installation of smart grid appliances that can be pre-programmed to run at off-peak energy times.
Sources:
Ehrhardt-Martinez, K., K. Donnely, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Savings Opportunities. Washington, D.C.: American Council for an Energy-Efficient Economy.

Pike Research. 2010. Smart appliance sales to start off slow, but 118 million units will be sold worldwide by 2019. http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-

forecasts-Pike-Research-3290.html.

U.S. Department of Energy. 2008. Energy Star. Clothes Washer Product Snapshot. http://www.energystar.gov/ia/partners/reps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf.

———. n.d. Energy Star. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialNewConstruction.pdf.

## 7: Energy-Efficient New Development

Measure:

Encourage and incentivize new development projects to exceed minimum Cal Green requirements.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | N/A |
| 2020 Reductions (MTCO2e): | -3,780 | Percentage of new buildings Exceeding minimum CALGreen requirements |
| 2035 Reductions (MTCO2e): | -9,460 | Percentage of new buildings Exceeding minimum CALGreen requirements |

Assumptions:

Reduction in electricity and natural gas use from new buildings is based on average energy reductions by building type and climate zone as provided in the California Air Pollution Control Officers Association's (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Building Standards Commission. 2010. 2010 California Green Building Standards Code. Sacramento: California Building Standards Commission.

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Sacramento: California Energy Commission.

## 8: Community Forestry Program

Measure:

Pursue a comprehensive program to plant and maintain trees on County-maintained roads, medians, and public parking lots in the unincorporated communities. Expand the program to include tree planting on private property where owners wish to be part of the program. Encourage property owners to plant and maintain trees near structures to reduce building energy demand.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | -240 | 0 |
| 2020 Reductions (MTCO2e): | -790 | 6,500 new trees planted |
| 2035 Reductions (MTCO2e): | -1,510 | 15,000 new trees planted |

Assumptions:
The community forestry GHG emissions reduction relies on an assumed rate of two trees planted per new household. The GHG reduction from these new trees will include the energy reductions from additional building shading and the reduced urban heat island, in addition to the sequestration benefits of tree planting.
Sources:
McHale, Melissa R., E. Gregory McPherson, and Ingrid C. Burke. 2007. The potential of urban tree plantings to be cost effective in carbon credit markets. Fort Collins, CO: Elsevier.

## 9: Countywide Energy Collaborative

Measure:
Build a collaborative network or organizational structure to work with the seven cities, other local and state agencies, investor-owned utilities, the California Energy Commission, and the California Public Utilities Commission to promote a wide range of energy efficiency and renewable programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | 0 to -20,680 | 50% of electricity from renewable sources |
| 2035 Reductions (MTCO2e): | -1,50 to -36,53010 | 75% of electricity from renewable sources |

Assumptions:
50% of electricity will come from renewable sources by 2020 and 75% from renewable sources by 2035.
Sources:
n/a

## 10: Commercial-Scale Renewable Energy

Measure:
Develop a comprehensive renewable energy strategy to encourage the commercial-scale installation of renewable energy projects within the county.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in the Renewable Portfolio Standard | |
| 2020 Reductions (MTCO2e): | Included in the Renewable Portfolio Standard | Megawatts of solar installed |

| | | |
|---|---|---|
| 2035 Reductions (MTCO2e): | Included in the Renewable Portfolio Standard | Megawatts of solar installed |

Assumptions:
To avoid overlap with the GHG emissions reductions from the Renewable Portfolio Standard, GHG emissions reductions from commercial-scale renewable energy projects are not separately quantified. Quantifying the GHG reduction of commercial scale renewable energy generated in SLO County would result in the double-counting of the GHG reduction benefit from these projects.

## 11: Small-Scale Renewable Energy

Measure:
Implement a financing program to provide property owners with low-interest loans for the installation of renewable energy resources.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -19,850 | 28 MW of renewable energy systems installed |
| 2035 Reductions (MTCO2e): | -20,130 | 50 MW of renewable energy systems installed |

Assumptions:
Participation in energy efficiency financing programs and the average energy savings per participant are based on program evaluations and research of existing programs in other jurisdictions.
Sources:
California Energy Commission. 2010. New Solar Homes Partnership, Third Edition. Sacramento: California Energy Commission.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative. 2010. Property Assessed Clean Energy Programs White Paper.

San Luis Obispo County. 2009. San Luis Obispo County General Plan: Housing Element. Planning and Building, San Luis Obispo, CA.

## 12: Renewable Energy Partnerships

Measure:
Collaborate with local and state governmental agencies (California Men's Colony, Cal Poly, Cuesta College, etc.) and energy facility operators to develop renewable energy sources at existing facilities.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | -450 | 1 MW of renewable energy installed |

| | | |
|---|---|---|
| 2020 Reductions (MTCO2e): | -760 | 2.5 MW of renewable energy installed |
| 2035 Reductions (MTCO2e): | -1,260 | 4 MW of renewable energy installed |

Assumptions:
This measure quantifies the GHG reductions that will occur from state and local agencies that are located in the unincorporated areas installing renewable energy at the various facilities. Cal Poly has installed several renewable energy facilities and will continue to install additional facilities as funding becomes available. This measure assumes that state and local agencies in the unincorporated areas will procure 10% of their electricity from renewable energy sources by 2020 and 25% by 2035.
Sources:
California Polytechnic State University Administration and Finance Division. 2010. Cal Poly Sustainability. http://www.afd.calpoly.edu/sustainability/metrics.asp.

## 13: Recycling

Measure:
Provide additional opportunities for county residents to recycle cardboard, glass, paper, and plastic products.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -6,170 | Percentage of residents and businesses with access to recycling opportunities |
| 2035 Reductions (MTCO2e): | -7,170 | Percentage of residents and businesses with access to recycling opportunities |

Assumptions:
Increased recycling will result in a higher waste diversion rate for unincorporated areas of the county. This measure relies on the reported diversion rate in 2006 and sets goals to achieve a 75% diversion rate by 2020 and 90% by 2035. Many of the community service districts negotiate the waste hauling contracts for residents and businesses within their jurisdiction. This measure assumes an increased diversion rate only for the portions of the population where the County is responsible for negotiating the waste hauling contract.
Sources:
California Integrated Waste Management Board. 2004. Statewide Waste Characterization Study. Sacramento: California Integrated Waste Management Board.

San Luis Obispo County. 2011. San Luis Obispo County Garbage Contacts. http://www.slocounty.ca.gov/PW/Franchise_Administration/Garbage_contacts.htm?quot;><span%20style=.

San Luis Obispo County Integrated Waste Management Authority. 2008. Ordinance No. 2008-3: An Ordinance Establishing Mandatory Recycling. San Luis Obispo, CA.

## 14: Composting & Green Waste

Measure:
Implement a composting and green waste program in those communities without them.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -3,230 | Percentage of residents and businesses with access to food waste and green waste opportunities |
| 2035 Reductions (MTCO2e): | -4,560 | Percentage of residents and businesses with access to food waste and green waste opportunities |

Assumptions:
The creation of a curbside compost and green waste program will result in a higher waste diversion rate for unincorporated areas of the county. This measure relies on the reported diversion rate in 2006 and sets goals to achieve a 75% diversion rate by 2020 and 90% by 2035. Many of the community service districts negotiate the waste hauling contracts for residents and businesses within their jurisdiction. This measure assumes an increased diversion rate only for the portions of the population where the County is responsible for negotiating the waste hauling contract.
Sources:
California Integrated Waste Management Board. 2004. Statewide Waste Characterization Study. Sacramento: California Integrated Waste Management Board.

San Luis Obispo County. 2009. Cold Canyon Landfill Draft Environmental Impact Report. San Luis Obispo, CA.

San Luis Obispo County Integrated Waste Management Authority. 2008. Ordinance No. 2008-3: An Ordinance Establishing Mandatory Recycling. San Luis Obispo, CA.

## 15: Construction & Demolition Waste

Measure:
Reduce construction and demolition waste by requiring a minimum of 75% of nonhazardous construction and demolition debris generated on site to be recycled or salvaged.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 50% construction and demolition diversion rate |
| 2020 Reductions (MTCO2e): | -1,360 | 75% construction and demolition diversion rate |
| 2035 Reductions (MTCO2e): | -2,220 | 85% Construction and demolition diversion rate |

Assumptions:
Increased construction and demolition waste recycling will result in a higher waste diversion rate for unincorporated areas of the county. This measure relies on the currently required diversion rate of 50% and sets goals to achieve a 75% diversion rate by 2020 and 85% by 2035.
Sources:
California Integrated Waste Management Board. 2004. Statewide Waste Characterization Study. Sacramento: California Integrated Waste Management Board.

## 16: Waste Hauling Fleet

Measure:
Encourage waste haulers on contract with the County to use clean, alternative fuels for waste collection vehicles.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified | Number of waste fleet vehicles using alternative fuels |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified | Number of waste fleet vehicles using alternative fuels |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified | Number of waste fleet vehicles using alternative fuels |

Assumptions:
The current size of the waste hauling fleet that serves residents and businesses in the unincorporated areas of the county is unknown.
Sources:
Central Coast Clean Cities Coalition. 2006. C5's Compressed Natural Gas Symposium. Central Coast Clean Cities Coalition. http://www.c-5.org/Archives/Other/CNG_2006/Agenda8.pdf.

Inform, Inc. 2006. New York City's Commercial Waste Hauling Fleets. New York, NY: Inform Inc.

## 17: Landfill Methane Capture

Measure:
Increase methane capture rates at all operating landfills in the county.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -13,120 | Methane capture rate of 80% for Cold Canyon, Chicago Grade, and Paso Robles landfills |
| 2035 Reductions (MTCO2e): | -17,800 | Methane capture rate of 85% for Cold Canyon, Chicago Grade, and Paso Robles landfills |

Assumptions:
This measure will rely on each operating landfill in the unincorporated county achieving a methane capture rate of 80% by 2020 and 85% by 2035. The 2006 baseline methane capture rate was averaged between all three landfills at 58%.

Sources:
California Integrated Waste Management Board. 2008. Technologies and Management Options for Reducing Greenhouse Gas Emissions from Landfills. Sacramento: California Integrated Waste Management Board.

San Luis Obispo County. 2009. Cold Canyon Landfill Draft Environmental Impact Report. San Luis Obispo, CA.

## 18: Strategic Growth

Measure:
Continue to implement strategic growth strategies that direct the county's future growth into existing communities and to provide complete services to meet local needs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in BAU Forecast | n/a |
| 2020 Reductions (MTCO2e): | Included in BAU Forecast | n/a |
| 2035 Reductions (MTCO2e): | Included in BAU Forecast | n/a |

Assumptions:
The vehicle miles traveled (VMT) reductions associated with strategic growth initiatives were included in the business-as-usual forecast of transportation-related emissions. SLOCOG's travel demand forecast model is designed to include the VMT from land uses with these strategic growth principles in place and therefore it is not possible to separate the GHG reduction benefit of these strategies being fully implemented from the forecast of the unincorporated County's VMT.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

## 19: Transit Accessibility

Measure:
Work with the San Luis Obispo Regional Transit Authority, San Luis Obispo Council of Governments, local cities, transit providers, and other agencies to identify transit nodes appropriate for mixed-use development and promote transit-oriented development where appropriate.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in BAU Forecast | Percentage of residents within a 1/2 mile of a transit stop |
| 2020 Reductions (MTCO2e): | Included in BAU Forecast | Percentage of residents within a 1/2 mile of a transit stop |

| | | |
|---|---|---|
| 2035 Reductions (MTCO2e): | Included in BAU Forecast | Percentage of residents within a 1/2 mile of a transit stop |

Assumptions:
The vehicle miles traveled (VMT) reductions associated with transit accessibility were included in the business-as-usual forecast of transportation-related emissions.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

## 20: Affordable Housing

Measure:
Continue to increase the amount of affordable housing provided in San Luis Obispo County. Affordable and below-market-rate housing provides greater opportunity for lower-income families to live closer to job and activity centers, providing residents with greater access to transit and alternative modes.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -2,390 to -4,000 | 1,000 new below-market-rate housing units |
| 2035 Reductions (MTCO2e): | -2,850 to -6,670 | 2,300 new below-market-rate housing units |

Assumptions:
This measure relies on San Luis Obispo County's Regional Housing Needs Allocation numbers, assuming that 25% of the county's new housing units will be available to extremely low-, very low-, low-, and moderate-income households.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

## 21: Bicycle & Pedestrian Network

Measure:
Improve access to community-wide pedestrian and bicycle networks by removing barriers and providing additional bike- and pedestrian-oriented infrastructure.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -1,600 to -8,050 | Miles of bike lane and sidewalks |
| 2035 Reductions (MTCO2e): | -1,910 to -9,510 | Miles of bike lane and sidewalks |

Assumptions:

Public and private investment in the improvement of bicycle and pedestrian networks through this measure will result in a 2% decrease in vehicle miles traveled.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

## 22: Parking Supply Limits

Measure:

Revise County parking requirements to ensure development meets the County's strategic growth objectives while providing alternative transportation choices to project residents and employees and efficient design options, as well as flexibility to project applicants. Specifically, reduce parking requirements in areas where a variety of uses and services are planned in close proximity to each other and to transit.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | Average shared parking reductions |
| 2020 Reductions (MTCO2e): | -2,010 to -19,670 | Average shared parking reductions |
| 2035 Reductions (MTCO2e): | -2,360 to -23,250 | Average shared parking reductions |

Assumptions:

This measure relies on the Institute of Transportation Engineers (ITE) parking generation rates based on proposed land uses in the unincorporated county and assumes a 10% reduction in parking spaces compared to ITE rates.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

Institute of Transportation Engineers. 2010. Parking Generation, 4th Edition: An ITE Informational Report. Washington, DC: Institute of Transportation Engineers.

## 23: Unbundle Parking Costs

Measure:

Parking and property costs will be separated to require those who choose to utilize a parking space to do so at an additional cost separate from the cost of the property.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | n/a |
| 2020 Reductions (MTCO2e): | -170 to -4,030 | n/a |

| | | |
|---|---|---|
| 2035 Reductions (MTCO2e): | -180 to -4,750 | n/a |

Assumptions:
This measure assumes that an average parking charge of $10 per month will result in a 1.0% reduction in vehicle miles traveled.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

### 24: Commute Trip Reduction Programs

Measure:
Continue to support voluntary commute trip reduction programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -1,700 to -3,850 | Participation in SLO Regional Rideshare programs and events |
| 2035 Reductions (MTCO2e): | -2,010 to -4,510 | Participation in SLO Regional Rideshare programs and events |

Assumptions:
Additional participation in commute trip reduction programs will result in a 4.8% reduction in commute-related VMT or 0.96% of all unincorporated county VMT.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Fehr & Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates.

### 25: Alternative Fuels

Measure:
Continue to expand the use and availability of alternative and low carbon fuels for vehicles and equipment.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -5,280 | Number of alternative fueling stations and participation in car-share programs |
| 2035 Reductions (MTCO2e): | -11,170 | Number of alternative fueling stations and participation in car-share programs |

Assumptions:
This measure quantifies the VMT and fuel savings impacts of expanded use of alternative fuel vehicles. These vehicles include neighborhood electric vehicles, hybrid electric vehicles, and all-electric vehicles. Benefits would also be gained from the increased use and availability of local car-sharing programs.
Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Department of Transportation. 2001. National Household Travel Survey. Washington, D.C.

Idaho National Laboratory. 2006. Full Size Electric Vehicles: Advanced Vehicle Testing Reports.

## 26: Water Conservation: New Construction

Measure:
Reduce potable water use by 20% in all newly constructed buildings by using the prescriptive or performance method provided in the California Green Building Code to demonstrate compliance.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -80 | 20% water savings from new development |
| 2035 Reductions (MTCO2e): | -180 | 20% water savings from new development |

Assumptions:
GHG emissions from electricity use related to water transmission delivery and treatment were estimated using California Energy Commission information related to the energy intensity of water operations. As required by CALGreen, all new structures will be required to reduce water use by 20% from baseline levels, decreasing energy use related to water.
Sources:
California Energy Commission. 2005. California's Water-Energy Relationship. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF .

———. 2006. Refining Estimates of Water-Related Energy Use in California. http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF.

City of Morro Bay. 2008. Water Management Plan Status Report. Morro Bay, CA.

City of Paso Robles. 2008. North County Forum: Draft Pumping Update.

City of San Luis Obispo. 2005. Urban Water Management Plan. San Luis Obispo, CA.

Natural Resources Defense Council. 2004. Energy Down the Drain: The Hidden Costs of California's Water Supply.

San Luis Obispo County. 2010. San Luis Obispo County Water Demand Analysis Methodology and Results. San Luis Obispo, CA.

## 27: Water Conservation Retrofit

Measure:

Continue to enforce retrofit upon sale requirements in Los Osos and the Nipomo Mesa and facilitate compliance with SB 407 in residential and commercial properties in other unincorporated areas of the County.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | 0 |
| 2020 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | Number of homes and businesses retrofitted |
| 2035 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | Number of homes and businesses retrofitted |

Sources:

San Luis Obispo County. 2008. Los Osos Groundwater Basin Retrofit Ordinances. http://www.slocounty.ca.gov/Assets/PL/pdfs/LORetrofitTitle8.pdf.

———. 2010. San Luis Obispo County Water Demand Analysis Methodology and Results. San Luis Obispo, CA.

## 28: Tiered Water Rates

Measure:

Implement tiered water rate structures to incentivize water conservation.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | 0 |
| 2020 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | Gallons of water saved |
| 2035 Reductions (MTCO2e): | Included in Water Conservation: Existing Buildings | Gallons of water saved |

Sources:

San Luis Obispo County. 2010. San Luis Obispo County Water Demand Analysis Methodology and Results. San Luis Obispo, CA.

## 29: Water Conservation: Existing Buildings

Measure:

Work with local CSDs to continue to implement indoor and outdoor conservation and rebate programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | -10 | 0 |
| 2020 Reductions (MTCO2e): | -40 | Gallons of water saved |
| 2035 Reductions (MTCO2e): | -70 | Gallons of water saved |

Assumptions:
GHG emissions from electricity use related to water transmission delivery and treatment were estimated using California Energy Commission information related to the energy intensity of water operations. The reduced water use for each jurisdiction or region within the county was identified in the San Luis Obispo County Water Demand Analysis Methodology and Results report. These reductions and water use have been translated into reduced energy use in this measure.
Sources:
California Energy Commission. 2005. California's Water-Energy Relationship. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF .

———. 2006. Refining Estimates of Water-Related Energy Use in California. http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF.

City of Morro Bay. 2008. Water Management Plan Status Report. Morro Bay, CA.

City of Paso Robles. 2008. North County Forum: Draft Pumping Update.

City of San Luis Obispo. 2005. Urban Water Management Plan. San Luis Obispo, CA.

Natural Resources Defense Council. 2004. Energy Down the Drain: The Hidden Costs of California's Water Supply.

San Luis Obispo County. 2010. San Luis Obispo County Water Demand Analysis Methodology and Results. San Luis Obispo, CA.

## 30: Water-Efficient Landscape

Measure:
Reduce outdoor water use in new landscapes through compliance with the County's Water-Efficient Landscape Ordinance.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Included in Water Conservation: New Development | 0 |
| 2020 Reductions (MTCO2e): | Included in Water Conservation: New Development | Gallons of water saved |
| 2035 Reductions (MTCO2e): | Included in Water Conservation: New Development | Gallons of water saved |

Sources:
California Building Standards Commission. 2010. 2010 California Green Building Standards Code.

Sacramento: California Building Standards Commission.

### 31: Recycled Water

Measure:
Increase the availability and use of recycled water for use in outdoor landscaping areas.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | 0 |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | Acre-feet of recycled water used |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | Acre-feet of recycled water used |

### 32: Greywater & Rainwater

Measure:
Encourage the installation and use of greywater and rainwater harvesting systems to reduce outdoor potable water use.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | 0 |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | Number of greywater and rainwater harvesting systems installed |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | Number of greywater and rainwater harvesting systems installed |

### 33: Agriculture Resource Conservation

Measure:
Encourage voluntary energy conservation through appropriate and practicable efficient energy, water, and resource management practices.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | Participation in conservation programs sponsored by UCCE, RCD, and NGOs. |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | Participation in conservation programs sponsored by UCCE, RCD, and NGOs. |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | Participation in conservation programs sponsored by UCCE, RCD, and NGOs. |

## 34: Soil & Crop Management

Measure:
The County will collaborate with Cal Poly, agriculturalists, the University of California Cooperative Extension (UCCE), and the County's resource conservation districts (RCDs) to develop and disseminate appropriate voluntary management practices for the application of pesticides and fertilizers, tillage practices, cover crops, and other techniques to reduce nitrous oxide emissions, maximize carbon sequestration, and reduce fuel use.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | Crop fertilization rates per acre |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | Crop fertilization rates per acre |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | Crop fertilization rates per acre |

Sources:
University of California Cooperative Extension, San Luis Obispo County. 2011. University of California Cooperative Extension. http://cesanluisobispo.ucdavis.edu/.

## 35: Livestock Management

Measure:
Implement a voluntary fermentation and manure management program.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | none |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | none |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | none |

Sources:
U.S. Environmental Protection Agency. 2010. Agriculture. Pasture, Rangeland, and Grazing Operations – Best Management Practices (BMPs). http://www.epa.gov/oecaagct/anprgbmp.html.

## 36: Off-Road Equipment

Measure:
Reduce fuel use and GHG emissions from off-road agricultural equipment.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | 0 | 0 |
| 2020 Reductions (MTCO2e): | -2,810 | 5% of all tractors will be zero-emissions vehicles |
| 2035 Reductions (MTCO2e): | -5,270 | 10% of all tractors will be zero-emissions vehicles |

Assumptions:
This measure relies on activity data from CARB's OFFROAD2007 software program related to agricultural equipment. It is estimated that agricultural tractors have an initial lifespan of 4,000 to 5,000 operating hours, or 10 years, before engines need to be overhauled or equipment is replaced. As equipment is replaced or retrofitted, it is expected that the fuel efficiency and emissions output from these engines will decrease and that the availability of zero-emissions vehicles result in fewer GHG emissions from agricultural equipment. This quantification conservatively assumes that by 2020, Zero emissions tractors will be available and approximately 5% of all tractors will utilize this new technology.
Sources:
California Air Resources Board. 2006. Off Road Emissions Inventory. OFFROAD2007, Version 1. Sacramento: California Air Resources Board.

———. 2011. AB 118 Air Quality Improvement Program. http://www.arb.ca.gov/msprog/aqip/aqip.htm.

## 37: Local Foods

Measure:
Reduce emissions from transport of agriculture-related products within the county through the encouragement of local food programs.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified | |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified | Number of community gardens<br>Number of farmers markets |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified | Number of community gardens<br>Number of farmers markets |

Sources:
U.S. Department of Agriculture. 2011. Know Your Farmer, Know Your Food Program. http://www.usda.gov/wps/portal/usda/knowyourfarmer?navid=KNOWYOURFARMER.

## 38: Agricultural Employee Transportation

Measure:
Reduce VMT associated with commuting by agricultural workers.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Included in Commute Trip Reduction Programs | Participation in SLO Regional Rideshare programs |
| 2020 Reductions (MTCO2e): | Supporting Measure – Included in Commute Trip Reduction Programs | Participation in SLO Regional Rideshare programs |

| | | |
|---|---|---|
| 2035 Reductions (MTCO2e): | Supporting Measure – Included in Commute Trip Reduction Programs | Participation in SLO Regional Rideshare programs |

Sources:
San Luis Obispo Council of Governments. 2008. SLOCOG Staff Report Agricultural Workers Transportation Program. http://library.slocog.org/PDFs/Agency_Mtgs_Agendas/TTAC_CTAC/2008/January%202008%20TTAC%20&%20CTAC%20Agendas/E-7%20Agricultural%20Workers%20Transportation%20Program.pdf.

## 39: Sequestration

Measure:
Identify opportunities for terrestrial and aquatic sequestration in the county, including but not limited to County lands, reclaimed mining lands, agricultural lands, and other areas as appropriate.

| Target Year | $MTCO_2e/yr$ | Performance Indicator |
|---|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified | 0 |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified | Acres of land used to sequester carbon |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified | Acres of land used to sequester carbon |

# APPENDIX D:
# COUNTY OPERATIONS GHG REDUCTION MEASURE TECHNICAL APPENDIX

## E 1: Facility Energy Efficiency

Measure:
Continue to retrofit existing County facilities and implement energy conservation measures and efficiency programs.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -60 |
| 2020 Reductions (MTCO2e): | -370 |
| 2035 Reductions (MTCO2e): | -400 |

Indicator: Number of facilities retrofitted
Energy savings at County facilities

Assumptions:
The County's Energy Efficiency Conservation Strategy (EECS) was utilized to determine the annual average energy savings from lighting and HVAC retrofits already completed.

Sources:
Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

Haq, Zahurul. n.d. Energy Savings through HVAC System Improvement. http://www.lged-rein.org/archive_file/books/ces/Energy_Sav_HVAC_System.pdf.

San Luis Obispo County. 2009. Energy Efficiency Conservation Strategy. San Luis Obispo, CA.

———. 2010.General Plan, Conservation and Open Space Element. San Luis Obispo, CA.

U.S. Environmental Protection Agency. n.d. EnergyStar Building Manual: Heating and Cooling System Upgrades. http://www.energystar.gov/ia/business/BUM_heat_cool.pdf.

## E 2: Energy Conservation & Education

Measure:
Promote energy conservation through educational and competition-based programs.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -90 |
| 2035 Reductions (MTCO2e): | -80 |

Indicators: Participation in energy conservation programs
Energy savings at County facilities

Assumptions:
Increased education and awareness of energy used by County employees will reduce occupied building energy use by 2% by 2020.

Sources:
U.S. Environmental Protection Agency; U.S. Department of Energy. 2011. The Energy Star Challenge. http://www.energystar.gov/index.cfm?c=challenge.bus_challenge.

## E 3: Computer Network Upgrades

Measure:
Reduce computer energy use through software, hardware, and network upgrades.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -10 |
| 2035 Reductions (MTCO2e): | -30 |

Indicators: Number of Energy Star certified computers, monitors, and pieces of office equipment

Assumptions:

Ensuring computers are turned off at the end of the workday and purchasing Energy Star rated office equipment will reduce energy use in County facilities. This measure assumes that as computers are replaced, they will use less energy.

Sources:

California Polytechnic State University Facilities Department. 2009. Energy Efficiency Program Partnership Best Practice Awards Application Form. http://www.afd.calpoly.edu/sustainability/docs /Awards/2009_BP_Award_GCP_Summary.pdf.

Savage, Guy. 2011. Deputy Director, General Services, Information Technology. San Luis Obispo County. E-mail correspondence, January 5.

U.S. Department of Energy. 2011. Estimating Appliance and Home Electronic Energy Use. http://www.energysavers.gov/your_home/appliances/index.cfm/mytopic=10040.

## E 4: Operations & Maintenance

Measure:

Develop green building operation and maintenance guidelines to be followed by County employees and contractors.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified |

Indicators: None

Sources:

San Luis Obispo County. 2010. General Plan, Conservation and Open Space Element. San Luis Obispo, CA.

## E 5: Tree Plantings

Measure:

Continue to plant trees for building shading and carbon sequestration purposes.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -30 |
| 2020 Reductions (MTCO2e): | -70 |
| 2035 Reductions (MTCO2e): | -120 |

Indicators: Number of trees planted

Assumptions:

Increased tree plantings at parks and nearby County facilities will not only offset energy use in

buildings through increased shading and climate cooling but will also sequester carbon. This measure estimates that the County will plant 100 trees by 2020 adjacent to buildings and an additional 1,000 trees in County parks and golf courses.

Sources:

McHale, Melissa R., E. Gregory McPherson, and Ingrid C. Burke. 2007. The potential of urban tree plantings to be cost effective in carbon credit markets. Fort Collins, CO: Elsevier.

## E 6: Street Lighting & Traffic Signals

Measure:

Replace lighting and traffic signal fixtures with more efficient light-emitting diode (LED) lighting.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -20 |
| 2035 Reductions (MTCO2e): | -30 |

Indicators: Number of streetlights and traffic signals retrofitted

Assumptions:

The County will replace all existing streetlights and traffic signals with LED light bulbs. LED lighting will reduce energy use from streetlights and traffic signal equipment by approximately 60% from street lighting and by 28% from traffic signals.

Sources:

City of Little Rock. 2003. Conventional Vs LED Traffic Signals; Operational Characteristics and Economic Feasibility. Little Rock, AR.

U.S. Department of Energy, Pacific Gas & Electric. 2008. LED Street Lighting: U.S. DOE Solid-State Lighting Technology Demonstration Gateway Program and PG&E Emerging Technologies Program. http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway_sf-streetlighting.pdf.

## E 7: New Facilities

Measure:

Require new or renovated County facilities to meet or exceed CALGreen's Tier 1 or the intent of LEED Silver requirements.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -260 |
| 2035 Reductions (MTCO2e): | -700 |

Indicators: Number of facilities achieving Tier 1 or LEED Silver requirements

Assumptions:

Complying with Tier 1 requirements of CALGreen will reduce electricity and natural gas use at County facilities by 5.8% and 14.5%, respectively. These energy reductions are in addition to the energy savings that will occur by complying with the minimum requirements of the Title 24 Energy Efficiency Standards.

Sources:

California Building Standards Commission. 2010. 2010 California Green Building Standards Code.

Sacramento: California Building Standards Commission.

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Sacramento: California Energy Commission.

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

## RE 1: Renewable Energy

Measure:

Explore opportunities to install alternative energy and co-generation facilities.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -120 |
| 2020 Reductions (MTCO2e): | -700 |
| 2035 Reductions (MTCO2e): | -820 |

Indicators: Megawatts of renewable energy installed

Assumptions:

This measure anticipates that the County will install renewable energy equipment at County facilities totaling 1.5 megawatts by 2020 and 2 megawatts by 2035.

Sources:

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

## W 1: Park & Golf Course Recycling

Measure:

Work with the Integrated Waste Management Authority (IWMA) to develop and implement a recycling program at the County's parks and golf courses.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -30 |
| 2035 Reductions (MTCO2e): | -40 |

Indicators: Percentage of parks and golf courses with recycling facilities

Assumptions:

This measure assumes that recyclable materials makes up 35% of park waste and that the County will install recycling receptacles at 75% of park and golf course facilities by 2020.

Sources:

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

Greater Vancouver Sewerage and Drainage District. 2008. Solid Waste Composition Study. http://www.metrovancouver.org/about/publications/Publications/SolidWasteCompositionStudyFinal-2007.pdf.

## W 2: Paperless Records

Measure:

Continue to implement paperless records management and reduce the amount of paper purchased.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -10 |
| 2020 Reductions (MTCO2e): | -10 |
| 2035 Reductions (MTCO2e): | -10 |

Indicators: Annual print counts

Assumptions:

Over the last five years, the County has significantly reduced paper purchasing by transitioning to electronic file and document storage systems. The continued reduction in paper use will result in a smaller portion of paper being sent to local landfills.

Sources:

California Integrated Waste Management Board. 1999. Public Administration Waste Characterization Study. http://www.calrecycle.ca.gov/WasteChar/BizGrpCp.asp.

Perez, Katie. 2010. Deputy Director – General Services, San Luis Obispo County. E-mail correspondence, October 26.

## W 3: Environmentally Preferable Purchasing

Measure:

Develop and implement an environmentally preferable purchasing (EPP) policy to purchase recycled content and toxic-free products for County supplies, equipment, and services and to promote recycling markets.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Action – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Action – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Action – Not Quantified |

Indicators: none

Sources:

San Luis Obispo County. 2010. General Plan, Conservation and Open Space Element. San Luis Obispo, CA.

## W 4: Compost Facilities

Measure:

Explore opportunities to compost food and yard waste at County facilities.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -80 |
| 2035 Reductions (MTCO2e): | -190 |

Indicators: Amount of food waste and green waste diverted at County facilities

Assumptions:

This measure anticipates that the County will install food waste and green waste equipment at facilities with high volumes of food and yard scraps. These facilities will reduce the waste sent to local landfills by approximately 7% by 2020 and by 13% by 2020.

Sources:
California Integrated Waste Management Board. 1999. Public Administration Waste Characterization Study. http://www.calrecycle.ca.gov/WasteChar/BizGrpCp.asp.

### W 5: Construction & Demolition Waste

Measure:
Require a minimum of 75% of County non-hazardous construction and demolition waste to be salvaged or recycled.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -20 |
| 2035 Reductions (MTCO2e): | -30 |

Indicators: Percentage of construction and demolition waste diverted from County projects
Assumptions:
The County will recycle, at a minimum, 75% of the construction and demolition waste from construction and roadway projects at all County facilities.
Sources:
California Integrated Waste Management Board. 1999. Public Administration Waste Characterization Study. http://www.calrecycle.ca.gov/WasteChar/BizGrpCp.asp.

### W 6: Vehicle Auctions

Measure:
Continue to auction off retired vehicles and equipment.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified |

Indicators: County fleet size
Number of vehicles auctioned
Assumptions:
By auctioning low-use or damaged vehicles and equipment, the County can extend the life of these vehicles and avoid sending these vehicles and equipment to a junkyard or landfill.

### VF 1: Hybrid Vehicles

Measure:
Substantially increase the number and proportion of alternative fuel, high fuel economy, electric, and hybrid vehicles and use of these vehicles within the County fleet.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -3 |
| 2020 Reductions (MTCO2e): | -60 |

| | |
|---|---|
| 2035 Reductions (MTCO2e): | -110 |

Indicators: Number of hybrid vehicles
Reduction in fuel use

Assumptions:
In 2010, the County purchased 3 hybrid vehicles. The County will continue to purchase hybrid vehicles, as economically feasible, to total 15% of all non-police and fire vehicles by 2020 and 30% by 2035.

Sources:
U.S. Department of Energy. 2011. FuelEconomy.gov. http://fueleconomy.gov/.

## VF 2: Car Sharing

Measure:
Increase participation in the County's car-sharing membership.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -2 |
| 2020 Reductions (MTCO2e): | -60 |
| 2035 Reductions (MTCO2e): | -110 |

Indicators: Number of participants in car-share membership
Annual VMT in car-share vehicles
VMT/fleet size of County vehicles

Assumptions:
The County's car-sharing membership allows staff to utilize alternative and fuel-efficient vehicles. The County's increased use of these vehicles will lead to a reduction in fuel use as the car-share vehicles are typically more fuel efficient that the County fleet. By 2020, the County will utilize car-share vehicles for 5% of total vehicle miles traveled.

Sources:
FunRide, Inc. 2011. Fun Ride Vehicles. http://www.myfunride.com/vehicles.html.

U.S. Department of Energy. 2011. FuelEconomy.gov. http://fueleconomy.gov/.

## VF 3: Alternative Fuels

Measure:
Explore the use of alternative fuels in County vehicles and support the development of alternative fueling stations within the county through participation in the Central Coast Clean Cities Coalition (C5).

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -3 |
| 2035 Reductions (MTCO2e): | -20 |

Indicators: Number of alternative-fuel vehicles

Assumptions:
As alternative fuels become more widely available, the County will retrofit existing or purchase new vehicles and equipment to run on alternative fuels. These alternative-fuel vehicles will replace 15% of all current diesel-fueled vehicles and equipment.

Sources:
U.S. Department of Energy. 2011. FuelEconomy.gov. http://fueleconomy.gov/.

## EC 1: New Facility Location

Measure:
Take into consideration facility location, proximity to other facilities, access to transit, and ability to provide bike storage facilities when constructing or leasing new facilities.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -290 |
| 2035 Reductions (MTCO2e): | -510 |

Indicators: Number of new facilities within a 1/2 mile of transit
Employee commute mode share
Assumptions:
Expanding general government services into regional centers throughout the county will reduce the distance traveled for commuting purposes by County employees. By 2020, these new regional facilities will reduce employee commuting by 5%. This reduction in employee commuting will be increased to 10% by 2035.
Sources:
San Luis Obispo County. 2010. General Plan, Conservation and Open Space Element. San Luis Obispo, CA.

## EC 2: Rideshare Participation

Measure:
Increase participation in Rideshare commuter programs.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -50 |
| 2020 Reductions (MTCO2e): | -80 |
| 2035 Reductions (MTCO2e): | -150 |

Indicators: Participation in SLO Regional Rideshare programs
Assumptions:
The number of employees currently participating in SLO Regional Rideshare programs totals 28% of all County employees. Through additional promotion and targeted marketing to departments with low participation rates, the County will reach a 35% participation rate by 2020 and 50% by 2035.
Sources:
Marshall, Morgen. 2010. Program Manager, SLO Regional Rideshare. E-mail correspondence, October 14.

## EC 3: Alternative Work Schedule

Measure:
Standardize County telecommuting and alternative work schedule policies among departments to facilitate participation as appropriate to job classifications.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | -240 |
| 2020 Reductions (MTCO2e): | -240 |
| 2035 Reductions (MTCO2e): | -290 |

Indicators: Number of employees telecommuting
Number of employees utilizing alternative work schedules

Assumptions:
Implementation of telecommuting and alternative work schedules for County employees resulted in a reduction of over 500,000 miles of employee commuting in 2010. The 2010 participation rate for alternative work schedules was approximately 20%. By 2020, participation in these work schedules and telecommuting will total 25% of all employees.

Sources:
Brown, Leslie. 2011. Administrative Analyst, San Luis Obispo County. E-mail correspondence, February 19.

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

## EC 4: Parking Passes

Measure:
Implement workplace parking pricing at County employment centers in Downtown San Luis Obispo. Charge employees wishing to utilize a parking space provided by the County a daily or monthly fee.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | 0 |
| 2020 Reductions (MTCO2e): | -40 |
| 2035 Reductions (MTCO2e): | -40 |

Indicators: Employee commute mode share

Assumptions:
Daily parking charges for employee parking spaces will encourage employees to seek alternative transportation options. Research has shown that daily parking passes will reduce VMT associated with commuting by approximately 12% depending on the rate charge and the location of the facility.

Sources:
California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices.

Victoria Transportation Policy Institute, Todd Litman. n.d. Transportation Elasticities. http://www.vtpi.org/elasticities.pdf.

## WC 1: Water Fixture Retrofits

Measure:
Retrofit facilities with water-efficient fixtures.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified |

Indicators: Number of fixtures replaced

Sources:

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

### WC 2: Water-Efficient Landscape

Measure:

Replace County-maintained turf landscapes (not including park recreational fields or areas) with water-efficient landscapes and demonstration gardens.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified |

Indicators: Acres of turf replaced with native landscape

Sources:

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

### WC 3: Golf Course Water Use

Measure:

Continue to reduce water use on County golf courses through participation in the Audubon International Cooperative Sanctuary Program.

| | |
|---|---|
| 2010 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2020 Reductions (MTCO2e): | Supporting Measure – Not Quantified |
| 2035 Reductions (MTCO2e): | Supporting Measure – Not Quantified |

Indicators: Reduction in water use at County golf courses

Sources:

Clew, Dave. 2011. Utilities Coordinator, San Luis Obispo County. E-mail correspondence.

Heptig, Josh. 2011. Golf Course Superintendent, San Luis Obispo County. E-mail correspondence.

# APPENDIX E:
# ADJUSTED BUSINESS AS USUAL FORECAST

Actions and legislation implemented by the State of California to reduce GHG emissions statewide will also have a measureable beneficial impact to San Luis Obispo County. State programs are included in the adjusted business as usual forecast to determine the additional level of local efforts that will be needed to meet the State recommended and County-adopted GHG reduction targets of 15% below baseline levels by 2020.

**Figure 1.** Summary of State GHG Reduction Impacts to SLO County

| State Reductions Summary | 2010 | 2020 | 2035 |
|---|---|---|---|
| **Pavley Reductions** | 0 | -58,200 | -100,660 |
| **LCFS Reductions** | 0 | -25,790 | -24,530 |
| **RPS Reductions** | -3,570 | -25,950 | -44,010 |
| **CSI Reductions** | -760 | -1,160 | -1,090 |
| **Title 24 Reductions** | 0 | -12,560 | -43,650 |
| **Total State Reductions** | -4,330 | -123,660 | -213,940 |

# ASSEMBLY BILL (AB) 1493 (PAVLEY)

### Methodology:

Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency (EPA) granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

The Pavley rules establish GHG emission standards for two different groups of passenger vehicles: 1) passenger cars (PC) and light duty trucks with test weights under 3,751 pounds loaded vehicle weight (LDT1); and 2) light duty trucks with test weights between 3,751 lbs. loaded vehicle weight and 8,500 lbs. gross vehicle weight (GVW) (LDT2). Medium-duty passenger vehicles (LDT3) between 8,500-10,000 lbs. GVW are included with manufacturers' LDT2 vehicles when determining compliance with California's GHG standards. For the purposes of this analysis, only vehicles up through 8,500 lbs were considered since the majority of LDT3 vehicles are commercial and therefore do not fall under the scope of the Pavley rules.

The GHG emission standards established by the Pavley regulation reflect not only exhaust $CO_2$ emissions resulting directly from operation of the vehicle, but also: 1) tailpipe emissions of $CH_4$ and $N_2O$; 2) $CO_2$ emissions resulting from operating the air conditioning system (indirect AC emissions); and 3) HFC refrigerant emissions released from the air conditioning system due to either leakage, losses during recharging, sudden releases due to accidents, or release from scrappage of the vehicle at end of life (direct AC emissions). This analysis accounts for $CO_2$ from tailpipes. Air conditioning is not included in EMFAC estimates of $CO_2e$ and methane and therefore not accounted for in the reductions.

GHG reductions from the Pavley standard were calculated using EMFAC 2007 data for San Luis Obispo County. EMFAC 2007 data includes the breakdown of vehicles by vehicle class and emissions factors per mile for each vehicle class. The impact that the Pavley Standard will have on passenger vehicles in the unincorporated county follows the methodology included in an EMFAC2007 post-processing tool provided by the California Air Resources Board. Emissions reductions per model year and vehicle class were applied to San Luis Obispo County's transportation emissions and will result in a 13% decrease in transportation related GHG emissions by 2020 and a 21% decrease by 2035.

### Citations:

California Air Resources Board. 2006. Emissions Factor 2007 Model Software. http://www.arb.ca.gov/msei/onroad/latest_version.htm

California Air Resources Board. 2010. *Clean Car Standards - Pavley, Assembly Bill 1493.* http://www.arb.ca.gov/cc/ccms/ccms.htm.

California Air Resources Board. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm.

Fehr and Peers. 2011. County of San Luis Obispo Climate Action Plan: Transportation Reduction Measures and Estimates. San Jose, CA.

## LOW CARBON FUEL STANDARD

### Methodology:

Because transportation is the largest single source of greenhouse gas emissions in California, the State is taking an integrated approach to reducing emissions from this sector. Beyond including vehicle efficiency improvements and lowering vehicle miles traveled, the State is proposing to reduce the carbon intensity of transportation fuels consumed in California. To

reduce the carbon intensity of transportation fuels, ARB is developing a Low Carbon Fuel Standard (LCFS), which would reduce the carbon intensity of California's transportation fuels by at least ten percent by 2020 as called for by Governor Schwarzenegger in Executive Order S-01-07. LCFS will incorporate compliance mechanisms that provide flexibility to fuel providers in how they meet the requirements to reduce greenhouse gas emissions.

The California Air Resources Board's Pavley I and Low Carbon Fuel Standard Postprocessor software was utilized to determine the impact that LCFS will have on GHG emissions in SLO County. Implementation of the Low Carbon Fuel Standard is estimated to reduce transportation related GHG emissions by an estimated 6% by 2020 and 5.1% by 2035.

### Citation:

California Air Resources Board. 2006. Emissions Factor 2007 Model Software. http://www.arb.ca.gov/msei/onroad/latest_version.htm

California Air Resources Board. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm.

## RENEWABLE PORTFOLIO STANDARD

### Methodology:

California's Renewable Portfolio Standard (RPS) mandates that utility providers procure 33% of their energy from renewable sources by 2020. PG&E is the provider of electricity in San Luis Obispo County and approximately 11.9% of utilities electricity came from qualified renewable sources in 2006. In 2010, PG&E maintained a portfolio with 17.7% of their total electricity sales coming from certified renewable energy sources. While PG&E has made significant strides to reach the 33% goal by 2020, the California Public Utilities Commission (CPUC) has indicated that energy providers are not likely to meet this target due to transmission and permitting issues that have proved to be significant barriers to the development of renewable energy. With these barriers, the calculation included in this Plan relies on a more realistic scenario modeled by the CPUC in their June 2009 RPS Implementation Analysis Report that PG&E's renewable energy will reach 28% in 2020 and 35% by 2035. This implementation analysis shows that by 2020, PG&E will be providing customers in unincorporated San Luis Obispo County an additional 16.1% of their electricity from renewable sources compared to baseline 2006 conditions. By 2035, the increase in renewable energy will result in 23.1% more renewable electricity compared to 2006.

**Citations:**

California Public Utilities Commission. 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/ 33PercentRPSImplementationAnalysisInterimReport.pdf.

California Public Utilities Commission. 2011. California Renewable Portfolio Standard. Sacramento, CA. http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm

# CALIFORNIA SOLAR INITIATIVE

**Methodology:**

The California Solar Initiative (CSI) was authorized in 2006 under Senate Bill (SB) 1 and allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities (IOUs): Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE). The CSI program has a budget of $2.167 billion to be expended by 2016 with a goal to reach 1,940 MW of installed power through out the state by that time. The CSI program has several components including the Research and Development, Single-family Affordable Solar Housing (SASH), Multi-family Affordable Solar Housing (MASH), and Solar Water Heating Pilot Program, each of which provides incentives to further the development and installation of new solar technology on California's buildings.

The CPUC provides complete solar installation data for each jurisdiction in California since 2006. GHG reductions related to the California Solar Initiative are incorporated into this Plan by identifying the total megawatts (MW) installed in unincorporated San Luis Obispo County since the start of the program and estimating the annual kWh output of the solar installations. This calculation also estimates the rate at which residents and businesses will continue to install solar equipment through 2016, the anticipated end year of the program. Between 2006 and 2010, residential and commercial customers installed approximately 2 MW of solar photovoltaic systems, estimated to generate 3.5 million kWh every year. By 2020, it is estimated that unincorporated San Luis Obispo County residents and businesses will have installed 3.5 MW of renewable energy systems that will produce 6.5 million kWh annually.

**Citations:**

California Energy Commission and California Public Utilities Commission. 2011. California Solar Initiative: California Solar Statistics - Geographical Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/

California Energy Commission and California Public Utilities Commission. 2010. *About the California Solar Initiative.* http://www.gosolarcalifornia.org/about/csi.php.

# CALIFORNIA BUILDING CODES, TITLE 24

**Methodology:**

Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. The 2010 triennial edition Title 24 applies to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This Plan focuses on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code or CALGreen Code. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

### *Part 6, 2008 Building Energy Efficiency Standards*

The most recent update to Title 24 Part 6, the California Energy Code, went into effect on January 1, 2010 for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for on-going triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy reductions due to future updates of Title 24 based on historic growth rates. Past updates to Title 24 have shown equal if not higher increases in efficiency as a result of the update. To be conservative, we estimate that each update to the Title 24 Standards will have 70% of the effectiveness of the 2008 vs. 2005 standards. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction. The energy impact of

2008 Title 24 Standards for non-residential alterations is modeled. Future updates to Title 24 standards for non-residential alterations are not taken into consideration for lack of data and certainty.

### *Part 11, 2010 California Green Building Code*

California is the first state in the nation to adopt a mandatory green building code, the California Green Building Standards Code, or CALGreen. The CALGreen Code was updated in 2010, and became a mandatory code beginning January 1, 2011. The Code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen code and may elect to adopt one of the two additional tiers. Local governments can adopt a Tier 1 or Tier 2 standard in order to achieve greater energy, water, and health benefits.

Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24 Part 6 standards. However, if a local government elects to adopt either of the tiers of CALGreen, additional prerequisites and electives must be implemented by new development projects subject to CALGreen. For the voluntary energy efficiency prerequisites, Tier 1 is a 15 % improvement and Tier 2 is a 30 % improvement over minimum Title 24 Part 6 requirements. The County has adopted the minimum requirements of CALGreen and is currently preparing a Green Building Ordinance which will go beyond those minimum requirements and is described in more detail in **Chapter 5.**

### Citations:

California Energy Commission. 2010. 2009 California Residential Appliance Saturation Study. Sacramento, CA. http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.